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Conducted exclusively by Subordinates of the Madras Medical Service.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

EDITED BY

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ASSISTANT APOTHECARY, MADRAS ESTABLISHMENT.

"I hold every man debtor to his profession from the which as men doe seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends, to be a help thereunto."—Lord BACON.

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PROSPECTUS FOR A MEDICAL JOURNAL.

It is proposed every second month, commencing early in October next, to publish a Journal of Medical Science, containing 64 octavo pages of letter press, should the number of subscribers warrant the projectors in commencing the undertaking.

This Journal, which will be called the *Journal of Medical Science*, will be conducted *entirely* by members of the Medical Subordinate Department of this Presidency, and will be supported mainly by literary contributions from the same source.

It is necessary that the Projector and Editors of this Journal should clearly intimate the ground they intend to occupy in conducting it, in order to avoid misapprehension, as much as possible.

The chief object of the Journal is to afford the intelligent and studious Medical Subordinates of this Presidency an opportunity of exhibiting proofs of their reading, experience, and observation, in the great Field of Disease ; of proving that the talents confided to their care have not been allowed to lie dormant and unimproved ; and of showing to their superiors of every class that they have, as a body, resolved to secure approbation by their zeal, intelligence and perseverance.

This Journal is intended to be the representative of the Medical Subordinate Department, an exponent of its abilities, knowledge and progress, not be it remembered, a harbour for its private feelings, or its petty jealousies.

The Editors regard their duty in this light as sacred; they will spare no pains to maintain the honorable and useful character of the Journal; but they will not allow it to be the medium of any unamiable altercations, or the means of propagating those personal and private janglings which, when admitted into any Journal, alike derogate from its respectability and its usefulness.

With these principles, which they intend to dwell upon more fully in their opening number, the Editors of this periodical beg humbly to present their bantling to the patronage of the Medical Public. From the liberality and kindness of Medical Officers they confidently expect both countenance and support, for they have already received from many, proofs of their warm interest in this new and hitherto untried undertaking.

From their subordinate brethren, they expect not only pecuniary, but also literary, subscriptions—one alone will not do; without money they must make their final bow, and without literary contributions their little Journal must fall to the ground.

The value of this Journal to the interests of the department from which it has originated, and with *which alone* it will be connected, is too obvious to require lengthened comment in a prospectus.

It is intended that the Journal should contain extracts from the leading Journals of Britain; short notices of the progress made from time to time in different departments of Medical Science; and an occasional condensed retrospect of the ground already secured by the exertions of faithful and devoted labourers.

Original communications will occupy a prominent part of the Journal: these will be carefully and in every case impartially selected, and will, the editors trust, be found to be of a kind reflecting honor upon their authors, and credit upon the subordinate department generally.

Literary and Pecuniary contributions are respectfully solicited.

A Medical Officer at the Presidency has kindly consented to assist the Editors in the selection of articles for the Journal.

The price of the Journal will be at the rate of One Rupee per number.

All *literary* contributions to be forwarded to Mr. G. W. Flynn, Medical College, *Post Paid*. All other communications, *Post Paid* to Mr. J. H. Stanhope, Proprietor, Hunter Street, Vepery.

Madras,
August, 1851.

PART FIRST.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Intermittent Fever.*—By Assistant Apothecary G. NORTON.

The word *fever* is derived from the latin *ferveo* to be hot. As a generic term it is used to designate a class of diseases which are invariably attended with heat of surface, and other symptoms more or less constant, varying in kind and degree, according to the type of fever which they serve to distinguish. The term fever is also applied in a more extended signification to denote that condition of the system, in which the temperature of the body is preternaturally increased, the pulse accelerated, with more or less general disturbance of the functions of the whole economy, symptoms which are dependent in such cases on organic or structural lesion. In the first of these states the disease is usually called *idiopathic fever*, in the second, symptomatic or *sympathetic fever*. It is proposed to consider fever in the first of these conditions, as it occurs in the Intermittent and Remittent forms, with special reference to the disease as it is observed in India, in certain localities of which extensive country, it may be witnessed in all its virulence, and in various degrees of intensity.

Before proceeding to the consideration of the subject matter of this discourse, I shall premise a few remarks on fevers in general.

I mentioned above, that the word fever is used in a double sense, to signify either a primary or secondary affection. In the first or primary condition it is regarded as a disease *sui generis*, the phenomena which characterise the malady not being traceable to any appreciable local injury. As a secondary affection, the symptoms are the result of an alteration either in the structure, or function, or functions of a part or organ, which affect the organism through the sympathies which the local lesion is capable of producing. In such a state, it is usual to say that the system sympathizes with the local action.

In the latter case we are perfectly able to comprehend the nature of the disease. We have some tangible cause for the train of symptoms we observe, and our remedies are accordingly applied to remove the lo-

cal injury. In cases of this description, we frequently succeed in arresting the febrile symptoms by appropriate means; especially when the fever does not run very high, and when it is not dependent on some inveterate chronic or malignant disease.

In the first or idiopathic form of fever, the rationale of the disease is not so clear. We witness a group of symptoms which sufficiently serve to distinguish the kind or form of fever present—of its real essence or nature we know nothing. We cannot in this, as in the other case, trace the disease to some known, local, or appreciable injury; the whole organism becomes affected; the functions of innervation, circulation, secretion, excretion, in short every organ, or system of organs are more or less involved in the morbid action, owing to the sympathies which exist between them; and the whole frame labors as if in some violent struggle, till either the disease, or the effort of the constitution, aided by art, succeeds in establishing the mastery. Should the disease prevail, the subject of the affection succumbs to its effects; on the other hand, restoration to health after a due period of convalescence is the consequence. Well might the humoral pathologists and philosophers of the Greek School have affirmed, that fever is a concoction of the humors, an effort of nature to get rid of effete matter from the systom, an effort of the "*vis medicatrix naturæ*" of Cullen.

In consequence of our ignorance of the true seat of the disease in what are called idiopathic fevers, our treatment of them is somewhat empirical. Without any definite object in view, our remedies are directed to combat urgent symptoms, and by suitable means to aid nature in effecting a cure. Here it must be remarked that the experience of ages has sanctioned the measures embraced under the term antiphlogistic treatment, when the symptoms partake of an inflammatory tendency, or threaten injury to any important viscus; evacuants and diaphoretics are used at the onset and also during the severity of the symptoms, and tonics and restoratives in the period of convalescence.

The effects of these several remedies are those that nature herself unaided by art seeks to accomplish, as may be evidenced by the loathing of food (indirect depletion); increased and sometimes excessive perspiration; oftentimes catharsis; copious secretion of urine, and other evacuations called *critical:* all of which those who have witnessed fever must have more or less observed in a very marked degree. The efforts of nature are sometimes unequal to the task; often she exceeds her work, and at other times her operations are misdirected. The experienced practitioner watches her with a faithful and attentive eye, and aids her as far as lies in his power, in the desired object of seeking to effect

a cure. Mischievous interference he is aware will be accompanied with, or followed by, injurious results.

The above are the several means which nature employs to remove the morbid action, by a principle inherent in the constitution, originally stamped upon it by the Creator that gave it being, for the integrity of the functions that constitute life. Call it by whatever name you please, "*vis medicatrix naturæ*" or "*vis vitæ*," it is a matter of perfect indifference, sufficient if we recognize and admit the fact of a preservative principle, the occult and mysterious operations of which on the animal economy we shall never perhaps be able to unravel.

Brown, the opponent and contemporary of Cullen, maintained quite an opposite opinion. Comparing the human frame to an organised machine endowed with a peculiar principle of excitability by means of various stimuli, he divided all diseases that affect it into two classes, which hea clled *Sthenic* and *Asthenic*. The former he regarded as diseases produced by accumulated excitability and inducing direct debility (the phlegmasiæ or acute diseases of the present Schools), and the latter he considered as diseases resulting from exhausted excitability and causing indirect debility (the chronic phlegmasiæ of the present time, and diseases dependent upon an *anemic* condition of the system.) His treatment was as simple as his theory, viz. to reduce excitability in the former case by contra stimulants (means that debilitate) and in the latter to increase excitability by an opposite course (stimulating remedies). His contempt of the powers of nature were such, that speaking of them in his Elements of Physic, he says, "In order both to prevent and cure diseases, we must always use the indication proposed, and stimulate or debilitate, *never wait or trust to the supposed powers of nature, which have no real existence.*" A writer of eminence, the late Dr. Macintosh, remarks on the above passage, "It can scarcely be believed that an author who acquired so much reputation could have been guilty of publishing such nonsense on a point of such vital importance." Brown had many converts in his day, but they soon began to fall off. His classification of diseases with slight modifications is still adopted by some physicians in Italy, but very few if any at the present time admit the passive condition of the animal organization.

There is much truth in the doctrine of the excitability of the human frame. That it is susceptible of impressions from within and without, is a tenet which none, according to the present state of our knowledge, can reasonably deny. But the great objection to the theory of Brown is, his having denied the innate powers of nature to resist morbid action, and his having placed so much reliance on the dogmatical principles of

increasing and decreasing excitability, upon which he made the cure of all diseases to depend. Were the treatment of human maladies so simple, man would, in the majority of cases be long lived, unless slaughtered in war, or made the victim of malevolence, or some other accident capable of depriving him of life. Nothing in my opinion, would be more easy than to stimulate, or debilitate, according to the indication proposed by Dr. Brown in the cure of disease.

Since the promulgation of the medical doctrines of Broussais, an eminent pathologist of France, the opinion that fevers are a special class of diseases independent of local origin has lost much ground. My own observations of what are called idiopathic fevers incline me to the belief, that they are symptomatic of irritation or inflammation of some organ or tissue; that the disease spreads by sympathy to other parts, until the whole organism becomes affected; the type of fever, and the severity of the attack, depending on the intensity of the irritation or inflammation, the sympathies that such is capable of awakening, and the energy of the constitution to resist morbid impressions, together with the predisposition to disease of the individual attacked, and other local circumstances. It would be waste of time to enter into discussion of a subject that has employed the pens of some of the ablest men of the profession, without profitable results. It may be assumed, however, that the local nature of all fevers will some day or other, in the progress of science, be established. Already has a writer (M. Rostan) affirmed that continued fevers can no longer be preserved in a philosophical classification, that they "are visceral phlegmasiæ, presenting symptomatic varieties, some are simple phlegmasiæ, others have a special character." Whatever may be the opinions entertained with regard to the local nature or otherwise of fevers, our general plan of treatment of the diseases that come under this head is the same as that employed for the cure of visceral phlegmasiæ with some slight modifications. On this point we have to console ourselves—we can with safety permit the learned doctors of the schools to indulge in their theories without allowing their opinions to influence our practice, and unless some notable change takes place in our knowledge of the disease, or some extraordinary means of cure be devised, our treatment of fevers, I am certain, will continue pretty much the same.

Most medical writers divide idiopathic fevers into—1. Intermittent; 2. Remittent; 3. Continued, and 4. Eruptive. Hectic fever usually classed among them, can no longer maintain its position as an idiopathic disease, it being evidently dependent on chronic visceral inflammation, or upon a depraved habit of body, or is the expression of the sys-

tem as a whole sympathizing with a part. Some writers of the present day reject typhus from their classification of idiopathic fevers.

From these observations of a cursory nature, I proceed to describe

I. *Intermittent Fevers.*

This form of fever is endemic in certain localities of India, particularly in those places situated along the banks and at the estuaries of rivers, low marshy grounds, and in the vicinity of jungles. The most fertile places of this disease in Southern India are the Wynaud jungles, Seringapatam and other situations in the Mysore country, and that tract of land denominated the Northern Circars, especially Goomsoor.

The symptoms or signs which distinguish the malady are sufficiently characteristic. They admit of being divided into three distinct stages, viz., a cold, a hot and a sweating stage, which follow each other in regular succession. The morbid phenomena cease after a while, to be reproduced again after an interval not always the same. The three stages taken together constitute a *paroxysm*; the interval between the cessation of one paroxysm and the commencement of the next is the period of *intermission*. The different periods at which the paroxysms recur form the *type* of the intermittent. When the paroxysms return every day the fever is *quotidian;* if every other day, *tertian;* if a day longer intervene, *quartan;* these are the chief types of intermittent fever. There are also double quotidians, double tertians and double quartans; these in my opinion, instead of marking any distinct feature of the disease, are but irregularities of the above mentioned types, there being not only a great disposition towards the conversion of one type into another, but also as regards the change of the intermittent to remittent, and this latter again to the continued form, and vice versa, according to individual peculiarities and the complications of the disease during its progress. In many cases it is difficult to trace and account satisfactorily for the different catenation and association of morbid actions.

I have frequently witnessed that the intermittent fevers of India recur at regular and stated periods, monthly or bi-monthly, in subjects once attacked with the disease; and this has continued to be the case so long as the individual remains exposed to the same endemic influences; a circumstance which renders it imperatively necessary when practicable, to remove the patient so situated out of the influence of the exciting causes, by transference to another station; and when this is done, the patient becomes free from further attacks. So favorable a result however does not always follow; though the individual be removed from the influence of the exciting cause, the paroxysms continue to recur

at irregular intervals (*erratic*), or exhibit something unusual in their stages (*anomalous*), or some morbid phenomenon presents itself instead of the stages of the paroxysm ("masked" fevers, *intermittens larvata*) in many cases each successive attack becomes more and more distant the constitution having acquired some power to resist the return of the morbid phenomena, (*intermittent irritation*). In several individuals so affected, the health gradually but perceptibly declines, a choleric or sallow hue is depicted on the countenance, pale and shriveled skin, dyspeptic symptoms, borborygmi, nervous headache, foul tongue, enlarged spleen, the effect of disordered digestion and nutrition, loss of flesh, &c. follow, in a word, the health becomes permanently deranged. In the majority of such cases there is no imminent risk, the individual vegetates rather than lives, but that natural feeling of health and vigor of frame has quitted him perhaps never to return. It frequently becomes necessary in this state, if the subject be a European, to advise a return to his native land, for change of climate; or if a soldier or sepoy, to send him to the coast, or in extreme cases to invalid or pension him.

No where have I seen the periodical recurrence of intermittent fevers with more faithful certainty than in China. During the residence of the British forces in the islands of Chusan, Koolongso and Hongkong, in all of which I did duty, I had frequent opportunities of observing the disease both in the European and Native constitution, particularly in the latter, and having been myself the subject of the affection, I can testify that there is something peculiar in the nature of intermittents to assume this periodical tendency in those once attacked, the *primum mobile* of the disease lurking as it were in the constitution to reproduce the malady at stated periods, despite the care, and precaution, the specifics, and other plans of treatment employed.

(To be continued.)

ARTICLE II.—*The Blood in Health and Disease, with Practical Remarks.* By Assistant Apothecary R. PRINCE.

Definition—Blood—*Sanguis.* That vital fluid, which, pervading every part of the living system, supplies it with the powers of life, and the materials of existence.

Colour, consistence, heat, and gravity—Blood is a thickish fluid. That drawn from an artery being of a bright scarlet colour containing oxygen, while that from a vein is of a darkish red and contains carbonic acid. It

temperature is about 100 Fah. and its specific gravity varies from 1·040 to 1·050, computing water as 1·000. This however will much depend on the sex and habit of the individual, or the nature of any disease from which the person may at the time be labouring. Its gravity is greater in the robust, than the feeble, and in man than in woman. In those diseases attended with copious watery discharges, as in cholera, and diabetes, blood drawn is of a higher specific gravity than in diseases merely of debility. At the same time blood of a specific gravity greater than that in health, (with the exception of diseases arising from the causes abovementioned,) would indicate that there was disease attended with plethora, and that the blood contained more than a due proportion of its animal constituents.

Odour and general character.—The odour of the blood is peculiar to the body from which drawn; and may in general be well distinguished. The blood of the higher animals is in general of the same character as man's. Flesh presents nearly the same appearance in all animals, yet when cooked discloses the greatest varieties, as to appearance and aroma.

Component parts.—The generally received opinion of the present day is, that the blood consists principally of the following ingredients,—

Globules, ...	127·	
Fibrine, ...	3·	
Animal matter, ...	72·	Andral and Gavarret's scale.
Salts, ...	8·	
Water, ...	720·	
	1000·	

An analysis of all the constituents of the blood, perhaps the most minute on the subject, is here annexed, though differing slightly from the broad outline of the former in proportional numbers it shows more distinctly the immense variety of ingredients that serve to form the circulating current. It has been taken from Kirke's and Paget's recent work on Physiology.

Water, ...	784·
Albumen, ...	70·
Fibrine, ...	2·2
Red Corpuscules.	
Globuline, ...	123·6
Hematine, ...	7·5
Fatty Matters.	
Cholesterine, ...	1·3
Cerebrine, ...	
Seroline, ...	
Oleic and Margaric Acids, ...	
Volatile and odorous fatty Acid, ...	
Fat containing Phosphorus, ...	

Inorganic Salts.

Chloride of Sodium,	..	...	3·6
Chloride of Potassium.	...	...	0·36
Tribasic Phosphate of Soda,	...	...	0·2
Carbonate of Soda,	...	...	0·84
Sulphate of Soda,	...	...	0·28
Phosphates of Lime and Magnesia,		...	0·2
Oxyde and Phosphate of Iron,.....		...	0·5
Extractive matter with salivary matter, Urea, biliary colouring matter, gases and accidental substances.		... ...	5·47
			1000.

Quantity of blood in the body.—The actual amount of blood in the healthy human body may be presumed to amount to about 48 pounds.

The watery portion of the blood is subject to changes from various causes, such as from the state of the atmosphere, the amount of bodily exercise, the lapse of time since food has been taken, &c.; these different causes will probably account for the trifling discrepancies that appear in the various analyses on this subject, found in medical books.

It will now be necessary to say a few words on the principal constituents of the blood and to notice their several uses in the animal economy, as well as point out some of the changes induced by them in disease.

Blood corpuscules, uses &c.—The red blood corpuscule consists of a central nucleus* and an enveloping colouring matter. They are extremely small about 3,900 of them placed end to end would extend the length of only one inch. Their shape is circular and flattened in man, but oval in fishes, birds and reptiles. Each globule presents the appearance of a flattened bi-concave disc, the sides are sometimes bi-convex possessing a central elevation. These globules, unlike some other constituents of the blood, generate themselves. Suspended in the liquor sanguinis, the globules run along in the centre of the calibre of the artery. The envelope in which the blood globule is contained having absorbed nutrient matter from the blood, when its term of life is out, bursts, and other globules developed in its centre are let loose; these eventually acquire the colouring matter of the blood. The nucleus of the globule is essentially fibrine which has a thin delicate covering from

* Recent investigations seem to prove that in the blood-corpuscules of man no nuclei exist; the appearance of a nucleus is owing, it is supposed, to a depression on the flattened surface of the discs, which causes a refraction of the rays of light; this appearance is not seen when the globules are rendered spherical by the imbibition of water: analogy however warrants us in supposing that a nucleus really exists, as Dr. Rees has maintained.—Ed.

which it cannot be separated, and in this is the colouring matter (Hematine) of the blood deposited. The blood globules are of the greatest use in the system. They are chiefly for the purpose of conveying oxygen to all parts of the body and of carrying away the carbon. They are chiefly intended for the purposes of respiration and nutrition* they assist in maintaining the temperature of the body. Some globules are white, being devoid of colouring matter, as in the conjunctiva† and the serous membranes, but in disease these tissues are highly injected. Like other constituents of the blood, the red globules in disease become either deficient or in excess. In healthy blood their relative proportion in 1000 parts is 127. Still the proportion of the blood corpuscules may fall as low as 100 in men, or 80 in women without materially affecting the general health. When the red particles are in excess it proves the existence of active disease generally of a plethoric character. The diseases which principally arise from their excess are active hœmorrhages, epistaxis, fevers, and eruptive diseases attended with inflammatory action. The globules may rise to 185 parts in the 1000, being 58 above the natural healthy standard. Depletion diminishes the number of the globules and it is by this mode of evacuation that these diseases are best treated.

There are also diseases it must be remembered where there exists a deficiency of the globules, as in chlorosis, anemia, diarrhœa, phthisis, &c. In chlorosis, the change in the blood seems attributable mainly to this deficiency of the blood globules. Their proportion is here reduced from 127 to 40, 30, or even to 27, the deficient 100 parts being made up by an increase in the watery portion. The system becomes weakened, the patient pale with sunken cheeks, pallor of the body generally, and a feeling of coldness in various parts, with that peculiar thrill in the arteries, so generally observable in this complaint, and which is characteristic of this change in the constitution of the blood. In cachexia, where the system is in a very highly disordered state, the blood corpuscules, which are also very

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* We doubt whether the red corpuscules contribute towards the nutrition of the system. They convey oxygen for the purpose of oxidizing and rendering soluble the effete matter with a view to its being more readily eliminated from the system—by this slow chemical change, heat is developed and the temperature maintained.—Ed.

† The non-existence of redness in the vessels of the conjunctive is not we believe due to the circulation of a different order of blood globules as our author advances, but to the red globules being in single files; when so disposed, the red color is not perceptible: of this fact any person can convince himself, by placing the tail of a tadpole under a microscope when the capillary vessels, having the blood corpuscules in single files, will be seen colourless; but on a stimulus being applied, the globules increase in quantity and the red color appears.—Ed.

deficient, are with difficulty replaced. To remedy this state and to increase the richness of the blood, by which alone we can hope to overcome this disease, good diet should be used with mild stimulants, fresh air, exercise, tonics and iron. How it is that iron proves so beneficial in these complaints, is hard to explain on therapeutical principles, but the fact is sufficiently proved—a valuable remedy is thus placed in the hands of the medical practitioner. In putrid fevers, vibices, ecchymoses, and malœna also are observed, very important changes have taken place in the blood. The vitality of the blood is lost, the globules burst and their contents poured forth. The color of blood approaches to that of claret and its consistence is but little greater than that of the liquid now mentioned. In melanosis the globules are deficient of oxygen, and become surcharged with carbon.

In the male, there is a greater proportion of red globules than in the female, this proportion is also affected by temperament. For instance, they are more numerous in the sanguine, than in the nervous temperament, and greater in number in the melancholic than in the phlegmatic.

Fibrine, uses, &c.—Fibrine is of a whitish colour, plastic, extensible and contractile. The quantity of fibrine in healthy blood is in the proportion of 3 to 1000 parts and is greater in the male than in the female. The characteristic of fibrine is, that in certain conditions it separates from its solution and assumes the solid form, or coagulates and it is on this ingredient that the coagulation of the blood depends as will be explained hereafter. It is the great material of which all other tissues are formed*. Its other principal uses are the checking of hœmorrhages, and in healthy inflammations assisting the reparation of injured parts in the healing of ulcers and fractures; the production of false membranes, &c.

Fibrine may be readily obtained. If a clot of blood be pressed in fine linen while a stream of water flows upon it, the whole of the blood colour is gradually removed and strings and shreds remain of a soft tough, elastic, and opaque white substance which is fibrine, though in an impure

* Mr. Simon and Dr. Zimmerman have advanced their opinions that "the fibrine of the blood is not to be regarded as its most organizable portion, but as an element resulting from the degeneration of the tissues,—and destined to speedy elimination from the circulating current" in opposition to the opinion commonly received among physiologists; viz. "that fibrine is the ingredient of the blood, which, in the ascending scale of development, stands next for appropriation into the living textures of the body, and which represents the ripeness, perfection, and nutritiveness." The reasons advanced by Mr. Simon, in opposition to the commonly received opinion, that fibrine is the most nutritive and organizable part of the blood together with the answers of the Editor of the British and Foreign Medico Chirurgical Review, are given in our pages—the same being selections from Braithwaite's Retrospect—Ed.

state. It may be also obtained by stiring blood while it coagulates, and collecting the shreds that attach themselves to the bunch of twigs.

As in the case of the red particles, there are diseases both from excess and deficiency of this ingredient. In fevers or inflammations of mucous membranes, the quantity of fibrine rises from 3 to 5 in 1000 parts of blood. Blood drawn in these cases rarely presents a decidedly buffy coat, though the clot in general is firm. But in diseases of serous membranes of the lungs, the liver and the heart, where there is a tendency to the formation of coagulable lymph, the fibrine rises from 3 to 8 or 10 per thousand parts : blood drawn presents a highly buffy coat, and the upper surface of the clot has a cup-like appearance with fringed borders. Again, in acute rheumatism the fibrine often rises to 13 parts to 1000, particularly if the patient happens to be a young, robust subject. Here the blood presents a distinct buffy coat with a deep and contracted cup on its surface. The fibrine in this case is so excessive in quantity, and so rich in quality, and contracts so powerfully as to squeeze the blood corpuscules out of the clot, leaving its buffy coat and cup-like cavity plainly visible where there is excess of fibrine. Depletion with nauseants are the best remedies together with mercury, which has the singular property of destroying fibrine and causing its absorption as is exemplified in cases of iritis, &c.

Deficiency of fibrine is apparent in such diseases as passive hœmorrhages, the purpura hœmorrhagica. Now, if a person is cupped or bled, the blood is so fluid, that it is difficult to stop the bleeding. The remedies in such cases are, good nourishing diet, exercise, fresh air, stimulants. The sulphate of soda in small doses has also been recommended.

In cases of plague, scurvy, in poisoning and in asphyxia, there are great alterations in the fibrine of the blood.

Albumen, uses, &c.—It will now be necessary to make a few remarks on albumen or the animal matter of the blood, which comes next in the order of constituents that serve to form the vital fluid.

It is a white glutinous substance, and exists in the proportion of 72 parts to 1000 of blood. It is more excessive in females than in males, and that can be observed by the great depositions of fatty matter lodged in their cellular tissue, which may be accounted for by the secluded mode of life and the nature of their occupations. It may well be considered as the raw material of the system ; the fibrine, in form resembling the thread ; and the tissues formed, resembling the cloth. Albumen differs from fibrine in not being capable of coagulation spontaneously, but requires a high temperature or other chemical means. Its chief use in the blood appears to be to give to that fluid consistency in

conjunction with the fibrine. Since, when fibrine is deficient, hœmorrhages supervene, and when the albumen is less than in the healthy state, there is a tendency to dropsies. The excess or deficiency is shewn in disease. It may rise from its natural standard of 72 to 114 in inflammatory diseases. This excess, however, may not always be absolute, but relative, as in cholera, where the increase in the quantity of the albumen is at the expense of the watery parts of the blood which have been drained off.

In the complaint called Bright's disease or albuminuria, there is a great deficiency of albumen; and in scarlet fever and sometimes in measles, when the blood has become vitiated, after these diseases have run their course, there is a tendency to dropsy. The albumen is also sometimes converted into an oily substance, as in polysarcia and in chylo-serous blood. The action of mercury in certain states of the system is capable of producing the same change in albumen.

The treatment of diseases in which there is either deficiency or excess of albumen may, as a general rule, be said to be the same as that stated for diseases under similar conditions with regard to fibrine, with perhaps the addition of a more animal than vegetable diet when this ingredient is wanting.

Salts, uses, &c.—The various salts that have been detected in the blood have already been enumerated at length in the former part of this essay. The principal are iron, soda, potash, phosphorus. They maintain the integrity of the blood, as salt preserves the sea. When the salts are diminished in quantity, loss of vitality and putrefaction takes place. Salts are rarely in excess in the blood, except perhaps in cases where the too free use of salt provisions produces a predisposition to cutaneous disease; and its absorption occasionally by the skin, which is the case sometimes with persons resident on the sea coast, leads to the same end. Its deficiency is a concomitant of malignant putrid diseases. In cholera there is a deprivation of salts, and injections into the veins of saline matter correspondent with what is found in healthy blood has in some instances proved beneficial in the treatment of that disease.

That the use of the salt is absolutely necessary to health, may be inferred from the fact, that it is universally used; and the loathsome diseases of persons who have for some time been unable to procure it sufficiently, attest that the uses of the salts in the blood are of a very important nature. The action of iron appears to be to give the colouring matter to the blood. It is the best tonic we possess, and its action in chlorosis, anemia &c. sufficiently proves *its value*.

Water.—The quantity of water present in 1000 parts of blood amounts

to 790 parts. It may be relatively increased or diminished. Water is in excess when the solid parts are deficient as in anemia, and deficient when they are in excess as in inflammatory diseases. It is the general solvent of all the ingredients of the liquor sanguinis, or at least the element in which all its materials are suspended. It is necessary that the water should be at some particular standard; since either in excess or deficiency the blood cannot with readiness permeate in the vessels.

Products of the blood.—We will now proceed to notice the more prominent products derived from the blood. 1st. Perspiration by the skin. 2nd. Urine by the kidneys. 3rd. Ceruminous matter by the glands of the ear. 4th. Tears by the lachrymal glands. 5th. Saliva by the salivary glands. 6th. Mucus by the mucous glands. 7th. Pancreatic juice by the pancreas. 8th. Biliary matter by the liver. 9th. Gastric juice by the stomach. 10th. Synovia by the gland of the joints. 11th. Semen by the testicles. 12th. Milk by the mammary glands.

These are the constant products furnished by the blood in health, the suppression or undue proportion of any of them constitutes disease or functional derangement.

Uses of the blood—The uses of the blood may be reduced to three—1st. To provide nutrition for all parts of the body. 2nd. To convey oxygen to the several parts either for the discharge of their functions or for combination with their refuse matters. 3rd. To bring from the several parts these refuse matters and discharge them at their proper outlets.

Coagulation of the blood.—This is a peculiar property of the vital fluid. Blood when drawn from the body presents a fluid appearance but in the course of ten or fifteen minutes a marked change is visible. There is now a jelly-like homogeneous substance, and still further changes going on we observe that small drops of yellowish transparent fluid begin to ooze out from the surface and gradually cover its upper part and sides, thus dividing it into two parts, a watery and a solid.

The watery part holding the salts and albumen in solution is called the serum, the solid part consisting of the fibrine and blood corpuscules is called the clot or crassamentum.

These changes in the blood may be thus accounted for. The liquor sanguinis, or liquid part of the blood, consists of serum holding fibrine in solution. Fibrine has the property of becoming solid when at rest. When a quantity of blood is drawn from the vessels, the fibrine being equally diffused throughout the circulating fluid, coagulates ; and serum and blood corpuscules are held, or as it were entangled, in the net work formed by the threads of fibrine. This is the jelly-like substance ; the fibrine having coagulated, now contracts. By this second act, the

serum, which was in part included in the clot, is gradually pressed out, and this collects in the vessel round the contracted clot. The blood is now divided into two portions as above stated, a watery and a solid.

Heat of the blood.—The heat of the blood is generally 98 F. Animal heat was once ascribed to the oxygen of the air uniting with the carbon in the lungs during inspiration, and which it expels in the form of carbonic acid, but it is now believed that animal heat is evolved wherever arterial blood becomes venous.

In children during health, the heat of the body has sometimes been found to rise to 108 F.

In disease, the heat of the body varies. For instance, in scarlatina and typhus, the heat may be increased to 106° or 107° F.

On the other hand in cholera, a thermometer placed under the tongue will fall to 77° or 79°, and in the disease called morbus ceruleus, where from a natural mal-formation of the heart and consequent defective circulation, the heat of the body varies on an average from 70° to 76° F.

Food, exercise, mental emotion, &c., may induce slight changes in the temperature of the body. But there is an inherent principle in the healthy human body to maintain its natural heat with very slight variations notwithstanding the force or intensity of external agents. Other causes may also be enumerated, by which the heat of the body is affected. 1st. The nervous system as when the supply of nervous influence is cut off, the temperature of the part falls below the healthy standard. 2nd. Age, where the heat of the body is found to be less in the old than in the young or middle aged person. 3rd. The influence of external covering should also be noticed.

Remarks.—So much has necessarily been said of that fluid which excites the heart to action, that distributes oxygen to every part and removes the carbon (thus giving rise to animal heat,) which supplies all the materials of the body and maintains them; the vitality of the whole so truly is " the blood thereof the life thereof."

That there is some difference between arterial and venous blood has been mentioned elsewhere, and almost all the changes observable in the vital fluid in various diseases have been stated under the head of the constituents of the blood, and alluded to under the heads of excess or deficiency. Such points as have been omitted are merely related here without entering into details.

1st. The quality of the blood is affected by its healthy secretions. 2nd. By the action of malaria. 3rd. By the specific poisons. 4th. By the diseases of the organs of assimilation and digestion. Blood when drawn from the body may be thus distinguished. Arterial blood, by

its scarlet colour and by flowing in jets, synchronous with the systole of the heart. Venous blood is known by its somewhat purple colour and continuous stream, though in some diseases, and in some persons under the influence of ether or chloroform it has been stated that arterial has presented the actual colour of venous blood.

Healthy blood is formed in the absorbent system, most probably in the lymphatic glands and from parent blood cells. Its vitality is maintained by the excretory organs through which the blood separates from itself materials which are injurious to it, as for instance, carbonic acid and urea, as also by the various parts of the body taking from the blood such materials as are necessary for their own nutriment and secretions.

From the constant changes produced in the blood in consequence of its having to supply and maintain so large a fabric as the human frame, it is necessary that there should be a continual supply of some material by which the blood may replenish itself. This is effected by the food which is taken into the stomach. It would be out of place here to describe the process of digestion, and the mode by which the chyle enters the circulation, suffice it to say, that it does, and thus supplies the place of what has been expended.

Infancy.—In infancy the supply of nutriment requires to be constant, in order to be adequate to the wants of the system, as the blood then has not only the nourishment, but the constant development of parts to provide for. The bones and muscles are enlarging, cartilaginous substances are becoming ossified, new products are being developed, tissues are being built up and enlarged, and, in proportion to the growth of the body, so must be the stability of the solid parts.

Manhood.—In adult age, the blood is not only duly replenished, but there is still nutriment in excess, at this time of life we observe depositions of fat in various parts of the body and the human frame is now in its finest proportions.

Old age.—Soon however comes on old age. The wants of the system are the same, but the organs of assimilation and digestion are incapable of the work required of them; then activity decreases, yet absorption continues. The blood is deficient in nutriment. The body has undergone the wear of years. The nutriment absorbed by the lacteals and conveyed into the blood, is insufficient to support the tottering frame, the fat deposited in riper and maturer years, is now called in to support the system and prolong the period of existence. This lasts but a short time, the blood and its vessels gradually lose that power they possessed in former years; the pulse becomes smaller and weaker, the extremities are colder, the sight more and more dim, the

hearing less acute, the step has lost the firm tread of youth, and has now the slow and timid one of age, and from the absorption of the subjacent fat the skin is shrivelled and hangs loosely.

Death.—At length nutrition is arrested, the circulation ceases, the body returns to its parent dust, and the spirit returns unto God who gave it.

PART SECOND.

As the Editors have made arrangements for publishing Notes taken by a Student of the College from Mr. BLACKLOCK's lectures on Medical Jurisprudence, they consider it advisable to present their readers with the Introductory Lecture, which that gentleman has kindly placed at their disposal in order to complete the course.

INTRODUCTORY LECTURE ON MEDICAL JURISPRUDENCE.

BY PROFESSOR A. BLACKLOCK.

Session, 1851-52.

Medical Jurisprudence, which I am now to have the honor of introducing to your notice, has been defined to be that science which teaches the application of every branch of medical knowledge to the purposes of the law, or in aid of the administration of public justice.* It has also been called forensic medicine, legal medicine, or justiciary medicine; but, under whichever of these designations the science be spoken of, it really means the application of Anatomy, Chemistry, Physiology, Medicine, Surgery and Midwifery in clearing up doubtful cases which are brought before Courts of Justice, as cases of injuries to the person, whether the person be killed or survive the injury. A medical jurist is a person who has made himself master of the science of medical jurisprudence; and it is with a view of making you medical jurists, or at least of imparting to you a competent knowledge of the science, that this course of lectures has been ordered as part of the curriculum of our College. From the number of branches of medical knowledge which I have already enumerated as constituting this compound science of me-

* Taylor's Medical Jurisprudence, 2nd Edition, page viii.

dical jurisprudence, you will perceive that a greater amount of preliminary acquirements is necessary in commencing its study, than for any other department of medical practice; and students are therefore not allowed to enter upon it till they have duly qualified themselves for its apprehension, by becoming the possessors of a solid foundation in the sciences of which it is made up.

As medical jurisprudence is a new feature in this College, and is not included in other branches of medical education, you cannot possibly have heard of its nature, or of its practical importance to yourselves, and to the best interests of society, and I shall therefore not offer any apology for commencing my preliminary observations, at the very beginning, by giving you a short account of its origin, and history.

We find from the Bible, in which we have the foundation of all history, that certain of the subjects in medical jurisprudence and police were attended to by the Israelites more than 3000 years ago. Some of the laws of the ancient Egyptians, about the same period, appear to have been tempered by medical considerations; and the Romans, almost from the commencement of their history, gave judicious heed to the opinions of physicians, in framing their laws, and carrying them into effect. The Greeks of that time, too, were guided, to some extent, in their decisions on criminal cases, by enlightened medical opinions; but, as the bodies of those who died under suspicious circumstances, were inspected more for the purpose of divination, than with a view to further the ends of justice, neither the Egyptians, Greeks, nor Romans, were able to make any advances in what has always been regarded by the moderns as the great end and aim of medico-legal science—the detection and exposure of crime. After the eleventh century everything pertaining to medicine fell, like every other concern of philosophy, into the hands of the monks, those grave old custodians of primeval and medieval knowledge, and remained with them, free from note or comment or improvement, during the long night, known now as the middle ages. From the dawn of the history of our race till the end of the dark ages, as they have also been termed, all matters most essentially connected with medico-legal enquiries were in the hands of the Priesthood, who were much more capable of diving intuitively into the subtleties of psychology, than of forming correct conclusions on matters of life and death, helpless and unaided as they were from the fewness of their medical precedents, and ignorant, as they seemed willing to be, in all matters relating to the structure of the body, and its liability to injury or disease. The morning of the Reformation, however, dawned at last, and the Germans, the great hearts

then of the European race, were the first to awake to a right sense of human duties and responsibilities. The beginning of the sixteenth century, distinguished as it was by a prevailing contempt for Ecclesiastical authority, was no less remarkable for the indifference with which ancient opinions in medicine came to be regarded. In the palmiest days of Greece and Rome, the greatest deference had been paid in medico-legal decisions to the opinions expressed, in former times, by the most learned Hippocrates; but now men were tired of deferring to authority to the exclusion of their own observation and judgment, and the incomplete or obscure diagnostics even of Hippocrates were found not always to favor a right decision, such as conscience and common sense would urge, after personal experience of a litigated case. Criminal Courts, too, began to find their need of qualified living medical guides, to assist them in their endeavours after justice, and thus in 1532, we find Charles V. of Germany giving voice to the more enlightened feeling of his age, by ordaining that the opinion of medical men "should be taken in every case where death had been occasioned by violent means, such as child-murder, poisoning, wounds, hanging, drowning, the procuring of abortion, and the like." This was the first regular endeavour to ensure the application of medical knowledge to the elucidation of legal difficulties, connected with crimes upon the person; and this enactment may be dated as the origin of all the study and attention which have subsequently been devoted to medical inquiries, in aid of judicial proceedings. Case after case has since that time been recorded, all more or less instructive, from containing some medical evidence, or decision upon the strength of that evidence, worthy of being either followed or avoided; and abundance of medical writers have from time to time grouped those cases and decisions, and done their best to deduce from them a body of principles for future guidance. In general, this has been done most ably; and however justly medical witnesses may often be sneered at for the glaring discrepancies of their evidence before the Courts of Law, the fault of such discrepancies cannot be charged to the writers of our works on medical jurisprudence, as no class of authors are more agreed upon all the essential points and bearings of the subject on which they treat. A medical man may be professionally incompetent, or the case in which he is called to give evidence may present unusual difficulties, even to a man otherwise well prepared, and usually capable of forming correct opinions; but that, as we shall see in time, is no good reason for involving medico-legal authorities in one sweeping condemnation, as is too often done.

From this brief allusion to books, we must now turn shortly to what

has been done for the advancement of medical jurisprudence by lectures. Legal medicine has always ranked as a science since the publication of the work of Zacchias at Rome, between 1621 and 1635; but it is one thing to regard any large department of human knowledge as a science, and another to make men consider the study and correct apprehension of it either necessary or essential to their own advancement, and to the interests of their fellows. Fully 170 years elapsed after the publication of the great book of Zacchias, which first gave something like a definite form to the study, before lectures on medical jurisprudence could be made to appear essential to the adequate training of young men for the medical profession; and it was only in 1806 that a professorship of the science was established in Edinburgh, and filled by Dr. Duncan; though not till after private lectures on the subject had been for some time delivered by his father, and much opposition had been made to those who held the power of endowment. So little was this great movement in the cause of justice, humanity and science appreciated, that the ministry of the period were severely animadverted on for thus doing their duty to their fellows, and were even boldly taxed by their successors in office with having perpetrated a job, merely to set the country at defiance. However severe the opposition to the establishment of that Chair might have been through the antagonism of party spirit, it cannot be doubted that the want of some such course of instruction had been severely felt, not only by the public who could estimate the injury to society from the conflicting statements often given in evidence by medical men, who were almost strangers to the subjects on which they undertook to inform the courts, but more severely still by medical witnesses themselves, who sometimes found themselves most critically situated in courts of justice, owing to want of training, and not seldom had their professional reputations injured and their emoluments curtailed, through the sorry exhibitions they were compelled to make of their ignorance. Books, as we have shown, there were then in plenty; but some sciences cannot be efficiently taught by books, and medical jurisprudence is one of them. There was no remedy nor safety here but instructions by lecture; and, though other schools were slow to follow the example of the Edinburgh University, every place of medical instruction now numbers a course of the kind among its classes. We are the last College to start a course of jurisprudence, even in this country, for Calcutta and Bombay have been long before us in this respect, and in the former advantages are enjoyed in the prosecution of the study, such as cannot, I believe, be obtained even in Great Britain. If we are the last, however, in point of time, it remains now with our-

selves to show, in a generous spirit of rivalry, that we shall not be behind our fellows. Once over the uninviting preliminary details connected with medical evidence, I know you will take kindly enough to a course of lectures on the very various matters which constitute the body of the science, as they are not only highly interesting from their professional bearings, but are calculated to rouse our curiosity and fix our attention, owing to the strange occurrences they bring to our notice, and the varied feelings which are always sure to be excited in us when we hear of criminal acts, and the steps taken for their detection. All the sham criminalities and mock miseries of the novelist and the poet must yield in heart absorbing interest to the actual occurrences which are brought to our knowledge in pages devoted to medical jurisprudence. Here poor human nature is exhibited to us denuded of all its concealments, and paining our moral sense, while it rivets our thoughts, by the very nakedness of its depravity; and here, too, we see how hideous man can become when he relies upon himself, undeterred and unguided by a Higher Intelligence.

But while medical jurisprudence presents us with many a story of human crime, and of the sufferings of our fellows, it is also pregnant with matters of serious moment to ourselves, as medical practitioners. It proves to us that if we would check the criminal, and spare humanity the consequences of his acts, by tracing out his operations, we must have professional knowledge of a very superior kind, and that knowledge urged on by a high sense of morality, and a desire to uphold the requirements of the law. The worst planned crimes frequently demand great skill for their exposure; but, as those who are by nature or position disposed to the commission of criminal acts will employ very complicated means, and take unusual and remarkable precautions to ensure secrecy and avoid detection, you will find you require to have acquirements of a high order, to enable you to clear up the questions which may occasionally be submitted to you in the course of legal enquiries. If the science of jurisprudence has become more and more capable of unravelling the intricacies of crime, it is no less true, that the evil disposed have fallen upon better devised methods of eluding suspicion, and baffling medical enquiry. We have numerous instances to prove that legal medicine has at times been quite inadequate to explain what has at first sight appeared very easy of explanation, and the accused has escaped conviction, not through the variety or novelty of his means, but through the ability with which he has designed and carried out his purpose. This was the case in the secret poisoning of the seventeenth century. It was thus also in the instances of murder by

suffocation, which occurred in Edinburgh in 1829; and during the last few y ears, the English public have been made painfully aware by the Essex poison cases of the extent to which medical enquiry may be baffled by superior cunning in the administration of very common instruments of destruction. Of late years, especially, there has been, in the words of Mr. Townsend, "a marked increase in all the crimes which require superior intelligence, rather than brute force, for their successful accomplishment, and which can be effected only by the misapplied union of talent and education." Independently altogether of the fact, that certain crimes have been more general, and been accomplished with greater security to the perpetrators at particular periods, and have been rooted out with difficulty, owing to local circumstances or habits of society favourable to the criminal, it has been remarked that the intricacies in murder cases of all kinds, and consequently the obstacles to their judicial exposure, have appeared to increase as our knowledge of medical jurisprudence has been improved. Criminal methods of evading the eye of justice have been brought to greater perfection (if there can be perfection in crime), almost in proportion as we have become more capable of unveiling them. This appears to be owing to the fact that no sooner is ability for good or evil developed in one quarter, than an equal ability, though not always of a corresponding kind or quality arises in another. Every advance in knowledge made by one section of society is sure to be followed, directly or indirectly, by an advance of some kind in the intellectual progress of some other part of the community. The intelligence which is nurtured in the Madras Medical College is not expended within its walls, nor diffused merely in its immediate neighbourhood, nor is it confined for ever after to its medical recipients. The instructions given here influence in time the sayings and doings of many who are but remotely connected with the recipients of the instructions, and who are less swayed by moral feelings and moral precepts than you are always understood to be; while an imperfect or partial knowledge of scientific matters, which have any popular interest or appeal in any way to human motives, finds its way slowly but surely to the lowest of our social circles from every fountain of information, be it school, or book, or College, becoming unfortunately at the same time more inaccurate, and therefore more liable to be misunderstood, and put to improper uses, the farther it is scattered from its source. Still more unfortunately a large portion of mankind listen with credulity to every whisper which may affect either the persons or the interests of their fellows, and are proportionately indifferent to those moral precepts,

which under a happier dispensation would render all persons, and their interests equally secure. Viewing the world as it is, however, we find that science and morality travel at very different rates, and that many people, who have ready ears and retentive enough memories, for smatterings of the one, are slow to comprehend, and averse to be guided by, the plainest dictates of the other. Even some of the greatest crimes which have ever occupied medico-legal attention, have been committed by men of considerable general and scientific acquirements. But knowledge itself can never be chargeable with any evil use which may be made of it, nor are we justified in supposing that forensic medicine tends in any way to prompt to the commission of crime. A little acquaintance with the action of arsenic or prussic acid is not likely of itself to lead any one to the perpetration of chemical homicide; but, if homicide should unfortunately appear a necessary mode of carrying out a wicked purpose, *that* knowledge may render the harborer of murderous intentions much more dangerous to society, and more likely to escape conviction than he otherwise would be. Numerous instances which could be quoted confirm this, and teach us also that a little knowledge here, as in other matters, is but too apt to occasion a degree of self-confidence, which has frequently blinded the unscrupulous to the risks they were sure to incur, and has hurried them to an ignominous end, safe though they had supposed themselves to be.

If then, we find, that we are liable to be called upon, not only to give evidence upon unpremeditated and easily discovered crimes, but also on those which have been deliberately planned and carefully carried out with all the advantages which cannot but be in general afforded even by a slight acquaintance with instruments of destruction, we must be prepared to oppose the skill and cunning of the criminal by obtaining a sound knowledge of all the subjects connected with medical jurisprudence. It is only by study we can hope to understand the intricate twists and turnings which crooked and wicked minds often take to elude the arm of the law, and assiduous application alone can ever enable us to appreciate those nice differences and distinctions in pathology and chemistry, upon which the proofs of innocence or guilt so often mainly depend. "To animate you to apply to the study" in the words employed many years ago by the American Physician, Rush, "recollect the extent of the services you will thereby be enabled to render to individuals and to the public. Fraud and violence may be detected and punished; unmerited infamy and death may be prevented; the widow and orphan may be saved from ruin; virgin purity and innocence may be vindicated; conjugal harmony and happiness may be restored; unjust and op-

pressive demands upon the services of your fellow-citizens may be obviated; and the sources of public misery may be removed by your testimony in courts of justice." There is still more, however, to animate you to study than all the inducements here held out to you by Dr. Rush. You are commencing an honorable career, and you look forward with pleasure to the respect with which you hope to be treated on account of your moral worth and medical qualifications; but to insure respect you must labour in order to be respected, and you must bear about with you the fruits of honest professional exertions. No man ever acquired either knowledge or character simply by doing nothing—"I don't know and I don't understand," wont recommend you much in a court of justice, when every one is expecting to hear some important medical testimony. If you do not *then* know what medical men are supposedto know, and cannot afford explanations on professional subjects with which you ought to be familiar, your character and medical reputation cannot but suffer, and the loss of the respect of those interested in you will surely follow. Well for you, too, if you do not in such a case lose respect for yourselves, and shudder at the idea of a court for ever after.

You may think this is a strong way of putting incentives of study before you, and that you are so little liable to be summoned as medical witnesses that anxiety about medico-legal knowledge is little called for. If so, let me give you a few words which Dr. Gordon Smith did not scruple to address to British practitioners, many of them old enough to be your grand fathers. "An acquaintance with toxicology would enable us to talk sense when called upon to describe the nature, properties, action, detection, and verification of poisons, about which two witnesses have seldom contrived to exhibit less than two opinions as to any one case, and of which there can be but one thing to be said in the shape of truth. If we attended to those applications of physiology which lead to the verification of other causes of death, we should be able to give satisfaction when required to depart from the common relations of our science, and its more ordinary connections in regard to derangements of the healthy structure, for the purpose of explaining such as are unusual. We should then speak neither upon supposition, nor from analogy, nor by inference; but be able to utter positive truths, to refer to similar facts, and to satisfy the juridical mind by a juridical answer to any specific interrogatory. "*I should suppose,*" is a form of reply but too frequent in the annals of medical evidence, where as in ninety-nine instances out of a hundred, we ought to be able to say that *such is* the *fact*. It is because medical men have been seldom able to answer in

this way, that the place of testimony has become clouded with horrors we shrink from encountering, and which due attention would dispel, rendering it an admissable arena, on which, in maintaining the cause of our profession before the public, we would reap personal benefit instead of misfortune. To appear as a medical witness, might then be as desirable as it is now deprecated, and be sought after as a privilege instead of being shunned as a calamity. It will be purely our own fault if it does not become so." Study, therefore, to acquire a competent knowledge of the subjects you are likely to be questioned on sometime in the course of your life. You owe it to yourselves as well educated and honest men, to be able to give every information on matters of accident and injury to your fellow-creatures. Society expects it of you from the advantages of your professional position ; and our paternal government, which affords us the blessings of mild and equitable laws, claims it from you as a right which every citizen must render to the State. In our peculiar position as paid servants of the government, the man who neglects to qualify himself for the correct performance of medico-legal duties, is unfaithful to his salt, and little better than a robber ; for he is but too likely to leave the interests of truth and justice in the lurch, at the very time he is expected to be of most essential service.

It is a common error to suppose that it is time enough for any one of our profession to prepare for giving evidence when he is actually summoned as a witness. This would probably be all very well, and we might in this way contrive to keep up a respectable appearance, provided the exigencies of juridical investigation would admit of delay for preparation. Fortunately for society, the requirements of the law are peremptory in all cases of a criminal complexion, and all the circumstances of the case, medical and moral, must be sifted at the moment they are brought to notice. Delays in enquiring into suspicious cases are always as favourable to the defeat of justice, in all countries and climates, as they are injurious to the best interests of our fellows. But, when a person is found dead in this country, every half hour which elapses after the discovery of the body, only serves to render the cause of death more difficult of detection ; and if the medical man who is summoned to the aid of the law-officers be not qualified by previous education to understand the medico-legal bearings of the business, there and then, without reference or consultation, the chances are, he will embarrass the Court of Inquest, damage his own reputation, and will either favor the escape of some guilty party, or peril the character and life of the really innocent.

To show you the working of the thing, and the positions in which

you are constantly liable to be placed in your medical capacity, I will take an instance such as is very commonly met with inthis country: —You are suddenly ordered to attend an Inquest upon a person found dead, and you have to go immediately. The quarter is named to which you are to repair; but you are not favoured with any further information; with nothing in short that can enable you to determine how you are to conduct yourself. You proceed to the spot indicated, and you are informed by the President of the court (supposing you are in a cantonment), that the body which is to be shown to you was found hanging by the neck about 2 hours ago. You have now to inspect the body and the scene of the occurrence, with the members of the inquest, and you have a double duty to perform; for you have not only to form an opinion from the testimony of the witnesses, as the members of the court have to do, but you have to bring your own habits of observation, and your own medical knowledge, to bear upon any appearance in the body or about the premises, that can in any way assist the court in coming to a right decision. You have then to determine whether or not the person died by hanging, or was killed in some other way before being suspended; and if you decide he has died by hanging, you have still to determine whether he died by his own suicidal act or by the homicidal acts of others. Without medico-legal knowledge, you would be perfectly bewildered by a case of the kind, and your confusion would not be lessened were the court to press you for your reasons for any decision you might come to; while you would feel irreparably disgraced if the court were compelled to set aside your evidence. Moreover, you have none of the advantages if I may call them so, which are often enjoyed by ordinary witnesses. Their obscurity and want of education plead as powerful excuses for them, when they fail through ignorance to satisfy the Court of Inquest; but your conduct under examination can never be favourably construed by any supposition of your being ignorant. The court looks to you for information, not only on strictly professional matters, but also on every collateral circumstances which ought to be perceived by a man with trained habits of observation, and they will either have the information, or they will comment, in their summing up, on the figure you have made before them. In this way the duties of a medical man at an inquest, disagreeable as they may be, are sometimes not half so disagreeable as the impressions he gives rise to by the manner inwhich he acquits himself in giving evidence. The court may then do him a great injury, or render him a very essential service, according as it forms a good or bad opinion of his general and professional acquirements. Any show of ignorance

before a tribunal of this kind is long held in remembrance. I have heard the conduct of a medical officer at an inquest held up to ridicule years after the occurrence, and you must not hope to be a bit more leniently treated, should you ever commit yourselves by any ignorant exhibitions.

Even when a medico-legal case is to be tried by jury, and you have time to gather information on the points at issue, you will find that special preparation will never compensate for the want of a regular course of study. A greater extent of acquirements is necessary to attain perfection in medical jurisprudence, than in any single branch of science; and no man ever obtained any great extent of mental acquirements suddenly. Besides, all the preparation you make may not be on the subjects upon which you are afterwards to be questioned, as you cannot form even an approximate idea as to what turn the enquiry may take, or what will be the line of examination. An examination which commences with questions of drowning may run very naturally into questions as to death by almost any other means. Enquiries connected with the effects of narcotic and narcotico-irritant poisons call for questions upon apoplexy, epilepsy and diseases of the heart; and cases of poisoning by arsenic often lead to a host of questions about cholera, hernia and idiopathic inflammations, which no amount of knowledge, if obtained merely on the spur of the moment, can ever enable a medical witness efficiently to answer, and which can only be provided against by laying up a good store of knowledge, by a patient and extensive course of study. I might give you plenty of instances of the folly of not being prepared to speak correctly on professional subjects before courts of inquiry; but I shall reserve these till we enter fairly on medical evidence. Some instances of an opposite character may be stated to you at present with more propriety, as the object of all introductions to science ought to be to encourage rather than to dishearten; and we ought to start in our pursuit of this science with a high idea of its value when correctly studied, and a conviction drawn from precedents, that we shall reap both praise and professional practice, if superior acquirements ever enable us to promote the ends of justice. It is mentioned in the life of Sir Astley Cooper, who was remarkable not only for being an acute observer, but also for reasoning quickly and accurately on what he observed "that when called to see a Mr. Blight of Deptford, who had been mortally wounded by a pistol shot in the year 1806, he inferred from an examination of the localities, that the shot must have been fired by a left handed man. The only left-handed person near the premises at the time was a Mr. Patch, a particular friend of the deceased, who was not in the least suspected. This man was after-

wards tried and conviected of the crime, and made a confession of his guilt before his execution."* But the most instructive instance perhaps ever brought to notice is one first given by Dr. Southwood Smith, and afterwards quoted by Dr. Beck, on account of the moral which it points to all men likely to be called upon for medical evidence. "Two men in a cottage in Scotland quarrelled. A scuffle ensued and one was killed. There was reason to believe that the survivor entertained deep and rooted enmity against the deceased. The body was examined judicially by six medical men, and they found a wound on the back part of the head. The question now arose as to the manner in which it was produced. If from a fall on the floor, it was a case of manslaughter—if inflicted by a weapon, it was murder. All agreed that the wound was the cause of death; but five out of the six stated that it might have been produced by a fall. The sixth considered this impossible. From a careful examination of the head he was satisfied that it was produced by some pointed body, capable of piercing through the integuments and bone. The floor was carefully searched for a nail or some other substance of that nature on which he might have fallen, but none such could be found. On the trial the man was acquitted of murder. Afterwards he confessed, that in the scuffle, he snatched up the snuffers, the sharp point of which he struck with all his force on the head of his enemy. It had penetrated through the bone of the skull and gone deep into the brain. This was a trial that excited great attention. The presiding judge had been struck with the clearness of mind, the patient, cautious investigation of the single medical witness; he often spoke of it to the magistracy and others by whom he was surrounded, and the consequence was, that this medical man soon found himself in the confidence of the best educated and most influential people of the neighbourhood.†" I could give other remarkable instances to prove the value of medical observations and medical inferences in clearing up the obscurities of judicial enquiries, but in bringing forward this last illustration, I have sufficiently served my purpose of proving, that whatever medical testimony you can adduce to assist a court of justice in arriving at a true knowledge of a case, will redound very much to your credit, and be no small recommendation for your own advancement. But independently of all reward and advancement, which are after all stimulants of very questionable necessity

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* Taylors M. J. 241.

† Beck's Jur: 1090.

to an honorable mind, you will in every case, in which you contribute by your professional knowledge and intelligence to the furtherance of justice, experience the comfortable feeling of having done your duty, and derive more certain and lasting pleasure from the testimony of a good conscience, than can ever be obtained from the praise or favor of your equals and superiors, however agreeable they may be to you.

I might now with some propriety address a few words to you on the necessity you are under of always maintaining a strict regard for truth. In every walk of life, and in the practice of every profession, it is incumbent upon us to represent facts, feelings and impressions as they really are or were, and not as we would have them to be. But in all affairs of medical jurisprudence, we of all others require to be especially careful that we be not led into any kind or degree of misrepresentation, on any subject of medical enquiry, as any want of adherence to truth on our part, would have, apart from all consideration of the heinousness of the crime, more effect in complicating evidence and hindering judicial proceedings, than could be occasioned by any other class of witnesses. In all medico-legal investigations the court expects much from our morality, as well as from our intelligence ; and, unless we habituate onrselves to truthful speaking in the very smallest concerns of every day life, we cannot hope that our minds will be free from a tendency to pervert the very various subjects of a cross examination. On this point, however, I need not enlarge at present, as you will see the value of truth when we come to medical evidence, and will be then more than ever impressed with a sense of the troubles and dangers which spring from the disregard of it.

I shall now pass on to a short notice of the difficulties in the way of medico-legal study and investigation in this country:—One great hinderance to our progress in the study, as it should apply to India, is occasioned by the want of a sufficient body of published recorded cases and decisions. The science is here only in its infancy, and we have comparatively few published precedents to guide us in our enquiries. In England, we have a fair idea of what may occur from having ample records, statistical and explanatory, of what has occurred. But here we are sometimes without the means of forming an idea of what is possible or impossible, probable or improbable, in the cases submitted for our opinions. For example, it would be well to know what are the feelings which most commonly prompt to infanticide. This subject has been submitted to considerable enquiry in its relations to caste in certain parts of the country, but we know very little of the concealments, and

the reasons for them, as they affect the general population. Then, again, we do not know what are the most generally employed poisons. We know that a large number of what may be called violent deaths from poison occur annually; but we are in ignorance as to the nature and extent of any slow poisoning which may be carried on. We know that certain poisons are generally preferred to others in the perpetration of homicide in different parts of the country, as Arsenic in the Madras Presidency, and Opium or Datura in Bombay and Bengal; but we do not know nearly all the poisons which can be obtained by the native population, nor in what instances they are able to baffle enquiry by employing poisons which induce symptoms and appearances similar to those of ordinary disease. The poisoner has far more means at his command in this country, and therefore many more chances of escaping detection here than in European countries. It is more than presumed that many substances are employed as poisons in this country of whose effects European medical men are very ignorant; and we cannot therefore be expected always to indicate from the consideration of the symptoms, what particular poison has most probably been administered; and still less are we able to isolate any suspected matter, for the simple reason, that we do not know where to begin our enquiries. In England, if we are called to a patient who has suddenly become insane, under suspicious circumstances, we would only have to enter into the probability of his having been drugged with Meloe, Datura, Hyosciamus, Belladonna, Conium or Aconite, as no other substances can be readily procured in Britain for a criminal purpose, which have any power of inducing maniacal appearances; and we would most likely be able from particular symptoms to say, which of this limited list of substances has been administered. But in this country, not only is it possible that insanity may be induced suddenly by one or other of these substances (as they are all procurable, though some of them with difficulty), but it is just as possible, and more than probable, that some other drug has been employed, equally capable of producing the symptoms in question, yet little if at all known to us by its appearance or toxicological or pathological effects. The different habits and customs also of the inhabitants of Europe and of India, and the great differences in temperature, ought to lead us to consider seriously, how far it may be safe or prudent for us to apply our knowledge of what has occurred in the criminal annals of the West to our investigations for the discovery of crime in the East. On this subject, however, I shall not dwell longer at present, as it will be my duty to point out during the course how you may be highly instrumental in

clearing up many of the difficulties which at present beset many subjects of medico-legal investigation in this country.

I have now, in conclusion, to make a few observations on the division of this course into two parts, Medical Jurisprudence and Tox icology. Owing to the peculiar position of Mr. Mayer as Chemical examiner at this Presidency, the College Council have found it necessary to assign to him the Toxicological department of the lectures on medical jurisprudence. Although some inconvenience must always attend the teaching of legal Toxicology apart from medical jurisprudence, we have precedents in some of the London Schools to warrant us in giving this arrangement at least a fair trial. Mr. Mayer will therefore explain the modes of testing for poisons and their respective values and medico-legal relations, and has kindly undertaken to furnish me from his laboratory with any Chemicals I may consider necessary for the more perfect elucidation of my remarks on the evidences of poisoning. You will thus have two opportunities of acquiring a knowledge of the best modes of applying tests, and of imprinting on your memories the inferences derivable from their behaviour. The important subject of testing cannot be too frequently repeated for your information, either by yourselves, or by others in your presence, and the same may be affirmed of all subjects connected with medico-legal enquiries; for if each Professor were to give you the Forsenic bearings of the subjects of his lecture, he would contribute, as we all sincerely desire, to the establishment of your respectability as medical practitioners, to your future comfort in times of professional difficulties, to your practical usefulness to a service which deserves our best acquirements, and exertions, and of which I shall conclude, for the present, by hoping you may all in time be truly good and useful members.

PART THIRD.

REMARKS BY THE EDITORS.

In submitting to the public this our first number of the Madras Journal of Medical Science, it becomes us to offer our reasons for its appearance.

India presents a wide field for medical research and investiga-

tion, and there are not wanting, among the members of the Subordinate Medical Department, individuals possessing the spirit of enquiry and love of observation to take advantage of the field of disease thus thrown open to them. Many interesting facts which fall under their notice and form the subjects of their enquiry now, must be lost to the profession, or confined within the limits of the enquirer's own mind, from the absence of any means of making them public. Facts of the kind alluded to, it is true, may be of comparatively small importance, yet when puhlished in an accumulated form, they may serve in the end to throw light on the history and treatment of Indian diseases by forming interesting subjects for future investigation.

The increasing knowledge of our subordinate brethren in the science of medicine, also points out the necessity of a periodical work, wherein they may give the result of their experience, observation and reflections upon those diseases which fall under their notice, and may in turn profit by the experience and opinions of others, thus keeping up an interchange of views and ideas, and inciting each other to perseverance and exertion in the field of investigation. Their very usefulness as medical subordinates demands that they should be kept acquainted with the views taken of disease by European medical practitioners and teachers, and that they should also know of the researches entered upon in Great Britain and elsewhere, for the advancement of medical science. To enable them to do this, they must resort to expensive European periodicals, but this their limited means will not admit of; consequently, a cheap work supplying them with the required information, must be felt to be a great desideratum, and the prospect of such a work being placed within their reach must necessarily be hailed with pleasure.

The cordial support we have received, in obtaining a large number of subscribers in so short a time, and the amount of literary assistance promised, encourage us in our undertaking, and go far to prove the necessity which exists for a Medical Journal of the kind we now have the pleasure of starting into existence.

With reference to what has been promised in the Prospectus, we deem it desirable to explain our designs a little more in detail.

It is our intention that this journal should be *exclusively* conducted by the medical subordinates, its object being the *improve-*

ment of the members of this branch of the service through their own exertions. We purpose effecting this by collecting the scattered hints, and registering the important facts connected with Indian, medical practice, by publishing such essays, memoirs, remarks, or correspondence, with which we may be favored, on subjects conducive to the cure of disease or the preservation of health, and in this way to bring into the field the united efforts of many to promote an extensive circulation of collected facts and useful information for the improvement of the whole.

Prior to the institution of the Medical School at this Presidency had such a project as the one now under consideration been started, failure must have been the inevitable result owing to the want of individuals possessing the requisite education to enable them to contribute anything of sufficient interest for publication; but matters are now changed for the better;—the great proportion of our department consists of men who have received to a greater or less extent, a professional education, the remainder being subordinates of tested qualifications, acquired by their own industry and perseverance—creditable examples of what can be effected by unaided application and long continued observation of disease. We expect much assistance in this our new undertaking particularly from our junior members, and we hope sincerely we shall not be disappointed in our expectation of contributions both numerous and good.

Regulated by the principle now set forth, we wish it to be clearly understood that we cannot without vitiating it, give publicity to any article which does not emanate from a medical subordinate. We have no desire to go beyond these limits, as we make no pretensions to possess all the qualifications required for conducting a journal fitted to receive contributions coming from a higher sphere than that in which we ourselves move. Our aspirations are of a humble kind, and we do not wish to overstep these bounds. If we can in any way contribute to the advancement of our brethren, our object will be fully realized,—beyond this we do not intend to go.

We consider it advisable to publish a number of this journal *every second month* instead of *monthly* as previously intended. We have been induced to adopt this plan for many reasons. To pass a monthly publication through the press would occupy more

time than we can afford from the nature of our public duties. Those only who have had experience in passing medical papers through the Press can tell the delays and difficulties which are met with at every step ; and to these may be added the labors of correcting proofs, and the necessary time which must elapse in getting up illustrations.

Under these circumstances, and to obviate disappointment to our subscribers, as well as to make the work as pleasant as possible to ourselves, we have resolved to issue a number every second month. The price of each copy will be as before, *one Rupee.*

The arrangement which appears best suited to our journal is to divide it into five parts, the *first* part will be appropriated to *Original Communications*—the *second* to *Notes, taken by Subordinates or Students, of Lectures delivered at the Medical College*—the *third* to *Editorial Remarks*—the *fourth* to *Selections from European Periodicals, &c.*, and the *fifth* to *Medical News* and *Miscellanies.* Upon each of these divisions the Editors beg to offer a few remarks.

Under the *first division* will be included medical and surgical essays, contributions, and reflections ;—Physiological and pathological remarks, subjects illustrative of natural history, chemistry and pharmacy ; descriptions of therapeutic agents used in India ;—Essays on epidemic and endemic diseases ;—Memoirs on the drugs used by native practitioners, either in the cure, or prevention of disease, &c. To this last subject, we beg to direct the particular attention of our subordinate brethren of the profession, as many useful drugs and preparations exist in India which, for the want of a correct knowledge of their actions on the human system are completely lost to the profession. To the industrious enquirer a wide field is here thrown open for research. In sending papers upon this subject we wish the authors to be minute, correct and copious in their descriptions, which should embrace the following points—the native name—the drug how procurable—if a vegetable substance, give a description of the plant—in what parts of the country found. If a compound—how prepared—an account of the ingredients and where these can be obtained—their properties doses, and prices—their effects on man or animals—opinion of the Hakeems regarding their use, and whether noticed before by European writers. A notice of some of the native works on

medicine would also prove interesting. Indian toxicology affords ample materials for investigation and forms an important and interesting branch of study. Very little is known regarding the vegetable poisons of India, and for the information of our intended contributors, we give the following hints to guide them in their enquiry—a complete description of the drugs and minerals used by natives in poisoning, in producing stupefaction with criminal intention, or in bringing on abortion—results of experiments made on the lower animals, embracing a minute account of the dose, the time which elapsed after the administration of the substance before the appearance of symptoms, the symptoms during life and pathological appearances after death.* If the investigation of the above subjects were patiently and systematically carried out, much good would necessarily result and the labors of the enquirer would not pass unrewarded. Other branches also of medical jurisprudence, would prove interesting to any of our brethren who would wish to strike into this path of enquiry,—a consideration for example of the various modes adopted by the natives in effecting homicide and infanticide; the legal inspection of bodies how carried out, the means adopted by the authorities in bringing the culprit to justice, the power and proceedings of courts of inquests, the peculiarities of native evidences, and various other matters too tedious to detail, would form very useful subjects of observation and reflection. These facts if accumulated and published would lead to discussions and suggestions for improvement, and in this way aid materially the administration of justice.

To the following subjects also we request the attention of our correspondents;—the marching of troops, the mode of conveyance, a description of encamping grounds, an account of the countries passed through, of the climates, the jungles, and the waters.—Suggestions for improvements. Remarks upon the transport of sick &c. &c. Atmospheric peculiarities and their effects on European and native constitutions; habits of these two classes as predisposing them to disease; periodical reports of sick; accounts of

* We may here mention that specimens of all kinds whether illustrative of anatomical, Physiological, or Pathological, will be received by us for the museum of the medical College. They may be sent through medical officers of corps and departments free of expense directed to the Secretary of the Medical College.

prevailing diseases &c. A description of the different races of natives† scattered over India. Suggestions for putting down quackery and mal-practices in medicine and for raising the respectability of our department. In short, anything, will be acceptable which is in any way connected with the principles and practice of medicine or which forms a legitimate subject of enquiry and research.

In the *second* division will be published notes of courses of lectures delivered at the Medical College taken by the students or others for this journal. In this department of our work we will spare no pains in having these notes published in as useful a form as possible. If sufficient inducement offer we promise to do what lies in our power to enhance the usefulness of this department of the journal.

In the *third* part, will be entered such editorial remarks or reviews of original communications, as occasion may require; in this we will be guided by the principles of impartiality and justice.

The *fourth* part will contain selections from the European journals, and will form a division to which our labors will be carefully directed. In selecting parts for publication, we will be guided by the importance of the subject to the subordinate department, as it is our wish to bring into notice that information which will prove of real practical benefit, and not venture upon rare speculations and fanciful theories. By judicions selections we hope to render this division of our work both useful and interesting.

The *last* part will be devoted to medical news, medical biography, extracts from correspondence and miscellaneous matters connected with medicine and surgery, letters from correspondents, anecdotes of eminent medical men, and short sketches of the lives and labours of own brethren of the profession. Intelligence of removals, postings, and other interesting particulars connected with the medical department and its members, will be noticed from time to time.

As we have entered upon this undertaking purely from a desire

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† Specimens of skulls will be thanfuklly received by us for the museum of the medical college—as also curiosities and specimens of natural history.

to benefit the subordinate medical department, and not from any motives of pecuniary gain, and as our labors are not to receive the reward of payment, we feel less scruple at hinting that the prompt payment of subscriptions is absolutely necessary to enable the proprietor to do justice to the work. Regularity of subscriptions will form the simple condition upon which the journal will be forwarded to subscribers in the Mofussil.

We reserve to ourselves the right of rejecting such papers as may appear to us unsuited for publication, and are resolved zealously to watch the respectability of the work. Contributors who may furnish us with papers will be pleased to write them on one side of each page folded half margin.

As rejected communications will not be returned, contributors are advised to keep copies of all papers forwarded for publication.

Having thus stated the design and scope of the Madras Journal of Medical Science, we now have the more difficult task of pointing out to those for whom this journal is intended, our reasons for confining it within the sphere of the subordinate department, and of showing how its success or otherwise, is likely to affect the interests and prospects of this branch of the medical department.

Our Rulers have done much lately to raise the condition and respectability of our grade—they have held out rewards for the best written essays on diseases peculiar to India—they have raised the dignity of the medical school to that of a college, and by these and other means they have shown a desire to raise us in the scale of society and of public opinion ; but what have we done to show that we appreciate this care and liberality of Government? Certain individuals by their exertions may have proved themselves deserving of what has been done for them, but these are only isolated cases and form the exceptions to the rule and not the rule itself. There ought to be we think, a more general proof that the subordinates are alive to their interests and are willing to exert themselves so as to become useful servants of the state. We humbly put forth our opinion that this can best be done by establishing and keeping up with energy and spirit a periodical upon the principles we have laid down, in which the exertions of this department alone will be recorded and brought to the notice of the authorities and of the public, for by such means only can a true estimate be made of the industry, perseverance

and usefulness of the members comprising this branch of the service.

British India is progressing, slowly it may be, but still surely in civilization. We are all conversant with the fact, that now a days many of the most superstitious and most prejudiced class of natives will, in the hour of danger eagerly resort to the European medical practitioner for relief, and will even go so far as to admit him into their families to treat those diseases which are peculiar to females. Of this many instances daily occur around us, and constitute strong proofs that the natives are inclined to value European skill as it ought to be valued. It is pleasing to see it conquering and removing by degrees the deep rooted prejudices of the native community which have so long ruled paramount, even to the extent of debarring these people the use of means necessary for the preservation of life.

To administer then to the wants of such people, and to gain their further confidence in European skill, we believe no individuals are better adapted than those who from their infancy, are acquainted with the habits, religious superstitions, caste prejudices and language of the people of India.

With the preceding facts before us, is it not imperative on us to bestir ourselves to increased exertion in acquiring a thorough knowledge of our profession, so as to be able to discharge our responsible duties with correctness and judgement? We may thus look forward to the day when higher rewards and prospects may possibly follow, as the result of such industry and intelligence.

We sincerely hope that our brethren, impressed with the correctness of the preceding remarks, will strenuously exert themselves in the field of medicine and favor this journal with their best contributions; without such aid we cannot proceed in our undertaking. Pecuniary assistance alone will not do; we must have materials to make up the body of the work, as well as money to usher it into existence. One without the other will not answer our object; we have made a great and bold experiment, and let it not be said that, from indolence or apathy we failed, and thus prove inimical to our own interests. A cheering prospect is now presented to us, by the warm interest taken in our welfare by so many of the influential medical officers at the Presidency, and will be our fault if we do not take advantage of it.

In conclusion, we take this opportunity of offering our sincere

and grateful thanks to several of our superiors for the kind assistance they have given us in commencing our undertaking. To the Physician General, and members of the Medical Board are due our best thanks for the aid promised us. To our highly respected Superintending Surgeon and President of the Medical College Council, T. Key, Esq., our best acknowledgments are due for the warm interest he has always evinced in this, as well as *in every undertaking having for its object the improvement of the Medical Subordinate Department.* To the Professors of the Medical College, are also due our thanks for their encouragement, more especially to those who have come forward to assist us in getting up this journal with their advice and supervision, and also to one for the liberal offer of pecuniary assistance to enable the proprietor to publish the first number.

In our columns will be found the first part of a paper on Intermittent fever and an Essay on the blood in health and disease. We recommend these to the consideration of our readers as containing in a condensed form much information regarding Intermittent fever, and the physiological and pathological condition of that important fluid the blood.

PART FOURTH.

SELECTIONS.

ON THE NATURE OF THE FIBRIN OF THE BLOOD, AND ITS RELATION TO DISEASES.

(From a Review of Mr. Simon's Lectures on this subject, by the Editor of the Brit. and For. Med. Chirurg. Review.)

"First, I find that fibrin is undiminished by bleeding, however frequently repeated; nay, that it often, or even usually, increases under this debilitating treatment: its highest figure given in Andral's book (10·2) was at a fourth bleeding: and Scherer found it as high as 12·7 at the third venesection in a case of pneumonia. I find that under

many other circumstances of exhaustion and weakness and inanition, during the progress of starvation, during diseases essentially anæmic, during violent fatigue, and the like, its proportion has been found at least as high, perhaps higher, than in the inflammatory process. And as in these respects I find its proceeding to be in direct contrast to that of the red-globules (which we know to be potential elements in the blood, and which are at once reduced by bleeding or starvation), so also do I find a similar contrast in another striking particular. Messrs. Andral and Gavarret, in the course of their extensive researches in the comparative physiology of the blood, ascertained that an improvement in the breed of an animal tended always (*cæteres paribus*) to increase the proportion of its coloured blood-corpuscles; they found that the same improvement tended likewise to diminish the proportion of its fibrin. And I find further indications of the same inverse ratio between the fibrinousness and the perfection of the blood, in the facts—that there is little or no fibrin in the blood of the fœtus, none in the egg, none in the chyme, and less in the blood of the carnivora (who feed on it) than in that of the herbivora.

"Some of these facts, derived from very different sources, appear quite inexplicable on the theory that fibrin is essential to the progressive development of the tissues; and the opposite inference seems unavoidable, that it must be considered an excrementitious product, derived from the waste of the tissues or the oxidation of the blood, and in progress of elimination from the system. This conclusion, carried into the domain of pathology, would lead us to suppose, that an augmented proportion of fibrin in the blood (whether occurring in active disease, or within the limits of apparent health) can be taken as an indication only of increased labour and waste in certain elements of the body, not of an increased development in the resources and nutrition of the blood. And on the same grounds it would appear that a super-fibrination of the blood, in acute inflammatory diseases, must be regarded as a consequence and effect of those diseases, not as their cause, and not as a primary affection."

Again when speaking on a subsequent occasion, of the ulterior development of fibrin, Mr. Simon remarks:

"It appears, then, that fibrin may remain stationary, and be nourished; or it may degenerate and decay: thus much is certain. But, may it advance? may it be developed into any higher form? into any tissue?—Notwithstanding the prevalence of a very general opinion to the contrary, I believe I may venture to question its possession of this power, and may say, that I entertain extreme doubt whether, of itself, it ever shows the slightest disposition to cell-formation, or to any process of self development."

"Unfortunately, our opportunities of watching its solitary behaviour are very few; for, in almost every instance that can be thought of, albumen (which is probably the real regenerator of the tissues) is likewise present; and that great developmental activity, so often and so glowingly ascribed to fibrin, may, with at least equal probability, be considered the work of this associated albumen, for (on this latter assumption) the fibrin could merely be considered to furnish an inert mechanical support. For think, if fibrin were that restless element of growth end vital expan-

sion which some have fancied it, what a world of activity there would be in an aneurismal sac! A large aneurism, filled with laminated clot, has almost as much fibrin in it as the whole body put together; and yet it shows, on microscopical examination, no evidence of activity or of growth. At its circumference its pressure may have irritated surrounding parts, and may have provoked inflammatory effusion from them, but in the interior all is stationary and quiet. Towards the cavity, where the formation is most recent, lie the blood-corpuscles in a network of fibrin—the former in such numbers, that the latter can but very imperfectly be seen; but in passing outwards, as the corpuscles seem more and more wasted, the fibrin begins to show more distinctly, always adapting its meshes to the material within them so that innumerable blood-cells are seen, each in its separate setting of fibrin: in getting still nearer to the circumference of the sac, the arrangement becomes confused from the closer consolidation of the fibrin; but in no part of the structure have I been able to see any trace whatever of new organisation.

"There is a similar reluctance to the initiation of organic development in those other intra-vascular clots which form in tied-arteries. They undergo changes referable to their blood-corpuscles, and they become pale and contracted; but their fibrin may remain for many weeks, or perhaps permanently, unaltered, except for some increase of density. I have seen it after the lapse of six weeks, showing only a vague appearance of longitudinal striation, with no essential change of physical character, and without the slightest trace of new development in its substance."

And after alluding to Dr. Zwicky's observations on the metamorphosis of arterial clots into fibrous tissue, which he considers as depending on "some new influence being imparted to the clot by the prolongation of blood-vessels into its substance, much more than on any specific faculty of organic development residing in the fibrin itself," he continues:

"I do not wish it to be understood as, in my opinion, a proved and certain thing, that fibrin is insusceptible of ulterior development; but I find, as yet, a want of sufficient evidence to establish its possession of this power; and in the examination, both of intra-vascular clots and of inflammatory exudations. I find several facts which apparently militate against such a conclusion. In all such products, the fibrin has shown itself either stationary or retrogressive; either lying as first deposited, or contracting more and more densely; or altering, only to undergo degradation. So far as my knowledge extends of adhesive inflammation, and of the several reparative processes, I see no evidence that fibrin takes a more important part in them than that of holding the true albuminous blastema within its meshes, and thus occasionally serving as a provisional matrix and scaffolding for the development of cells, fibres, and blood-vessels, and I cannot but suspect, that those who have ascribed to fibrin so large a share in the processes of growth, have been somewhat under the influence of that prejudice to which I alluded in a former lecture, and have promoted this material to so high a rank in their pathology, merely because of its physical tendency to settle in a solid form."

[These opinions of Mr. Simon are answered as follows by the Editor of the 'British and Foreign Medico-Chirurgical Review.]

1. "Fibrin is undiminished by bleeding; nay, it often, or even usually increases under this debilitating treatment." This only proves that the process, whatever be its nature, on which the generation of fibrin depends, is not checked by loss of blood, a fact which affords no indication whatever that the fibrin is a product of disintegration. If the fibrin be, as we believe, that element of the blood whih is most directly and constantly required for the maintenane of the nutritive operations, it is easily conceivable that the All-wise Creator should have placed this process out of the reach of those accidents which affect the proportion of other less important elements of the blood; just as the action of the heart is entirely withdrawn from the control of the human will, and the respiratory movements are provided for by an instrumentality over which it can exert but a subordinate influence. Let it be remembered, that if fibrin be (as we believe) albumen undergoing vitalization, its *material* will always be ready, so long as there is any albumen in the blood; and if (as seems not improbable) the very act of circulation through the living tissues is one means whereby the vitalizing influence is exerted, this will be perpetually going on, so long as the circulation continues. It must be borne in mind, too, that a new supply of fibrin, as well as of albumen, is introduced into the blood after every act of digestion; for there is distinct evidence that fibrin is generated (at the expense of albumen) during the passage of the chyle through the lacteals; and if the researches of M. Cl. Bernard are correct the liver exerts a similar elaborative agency upon the albuminous matter which has been received into the blood of the vena portæ. Further, in all the cases alluded to by Mr. Simon, a very active inflammation was somewhere going on in the system; and thus, according to the current doctrine, an unusually active production of fibrin was taking place at the expense of the albumen of the blood. If not generated from this material, but resulting (as Mr. Simon thinks) from the disintegration of the tissues, how is it that in an attack of pneumonia, or of acute rheumatism, in which there is no reason to suppose that any extraordinary disintegration of tissues takes places, the proportion of fibrin in the blood mounts up to three, four, or five times its normal average?

2. "During diseases essentially anæmic, during violent fatigue, and the like, the proportion of fibrin has been found at least as high, perhaps higher, than in inflammation." We very much question whether, in any of these cases, the increase in the proportion of fibrin took place without the presence of the inflammatory condition. Evesy one knows that inflammatory complaints are peculiarly liable to occur when the system is imperfectly nourished: and Andral distinctly states, that in the three dogs which he submitted to experiment, two of them being wholly deprived of food, and the third partially so, the elevation in the proportion of fibrin from 2·3, 2·2, and 1·6 parts, in the three individuals respectively, to 4·5, 4, and 3·3 parts, was *coincident with inflammatory changes in the stomach*. Further, as in these diseases "essentially anæmic," there is no reason to suppose that a peculiarly rapid disintegration of the tissues is going on, we cannot see how the increase of fibrin in the blood of patients suffering under them, is in the least degree

confirmatory of Mr. Simon's doctrine. That the deficiency of nutrient material does not prevent the generation of fibrin out of what the blood contains, may be explained, as we have just shown, in a manner very different from that which Mr. Simon would have us adopt.

3. The argument founded upon the comparative amount of fibrin in different breeds of animals, as determined by the observations of Andral and Gavarret, can scarcely be admitted to have much weight, when it is recollected, that the breeds here spoken of were *herbivorous* animals, to which it is natural to possess *more* fibrin and fewer corpuscles than the carnivora, and that they were *domesticated* animals, in regard to which the phrase "improvement of breed" often means something very different from an increase of the general vigour. We can fancy that a stall-fed cow, yielding her eighteen quarts of milk daily, would be regarded by the farmer as a much more valuable animal than a hardy mountain cow affording not one third of that quantity; but the latter is well known to be the one possessing the greatest amount of vigour, and to be the least susceptible of disease. It is, in fact, the object of the breeder to produce a state of *artificial plethora;* and this condition, as is well known, is chacterised in man by an increase in the proportion of red corpuscles, without any corresponding increase, or even with a diminution, in that of the fibrin of the blood. If we extend our observations on comparative physiology a little further, we find that the red corpuscles, which Mr. Simon affirms to be "potential elements" of the blood, are altogether absent in the lowest known animal of the vertebrated sub-kingdom (we allude to the curious little *amphioxus* or lancelet,) and that scarcely any approach to them is presented through the whole invertebrated series, notwithstanding that among some of these there is an extraordinary amount of vital activity; consequently we cannot help looking upon their presence as connected with some function which is to be specially, if not exclusively, performed by the vertebrata. On the other hand, the presence of fibrin is universal; and its proportion in the blood is found to bear a close relation to the formative activity, in cases in which this is subject to periodical variations. Thus Mr. Newport found, that in the larva of the insect, at the period immediately preceding the exuviation of the skin and the formation of a new integument, the blood is extremely coagulable; whereas for some little time after this process has been performed, the blood is so deficient in coagulability, that it does not (as at other times) close the orifices of wounded vessels,—as if in consequence of the temporary exhaustion of the plastic material by the new production of the tegumentary tissue. In the pupa state, during which the formative activity is the greatest, and the disintegration of the living tissues must be reduced to its minimum by the complete inactivity of the animal the coagulability of the blood is great. But in the imago state, in which little or no further growth or development takes place, and in which, on the other hand, the activity of movement might be expected to produce an unusual disintegration, the plastic element seems to be almost entirely withdrawn.

4. "Further indications of the same inverse ratio between the fibrinousness and perfection of the blood," are found by Mr. Simon in the facts, "that there is little or no fibrin in the blood of the fœtus, none

in the egg, none in the chyme, and less in the blood of the carnivora (who feed on it) than in that of the herbivora." We are at a loss to see what possible argument can be drawn from any of these facts, except the first; and of this—the absence of fibrin in the blood of the fœtus—we must take leave to express a doubt. Mr. Simon does not cite his authority for the statement; and it is entirely opposed to all we know of the condition of the blood in other organisms, in which formative actions are going on energetically,—as in the larvæ of insects, which may be regarded as embryoes fitted to maintain an independent existence, and to procure and ingest their own food. The albumen of the egg does not stand in the relation of blood, but in that of food, to the chick; this food has to be assimilated by the nutrient organs before it can be converted into solid tissue; indeed, it would seem to be the special purpose of the germinal membrane to convert this raw material into the plastic circulating fluid. To advance the absence of fibrin in the egg, therefore, as an argument for its non-essentiality in the blood, is just as unsatisfactory an argument as it would be to say, that because fibrin is not to be found in bread or milk, its presence in the blood has no relation to the nourishment of the tissues. Mr. Simon does, indeed, make a near approximation to this absurdity, in advancing the absence of fibrin in the *chyme* as one of his "indications." But what does he say to the presence of fibrin in the *chyle*; to its progressive increase in proportion as the chyle advances along the lacteals, and more especially after its passage through the mesenteric glands; and this under circumstances which almost exclude the possibility of attributing its first presence and subsequent increase to the introduction of any disintegrating material,—to anything, in short, but to that assimilating operation which prepares the chyle for the part which the blood is to perform, and gradually converts it into a liquid which is fit to circulate through the sanguiferous system? We are equally astonished that Mr. Simon should think that the difference in the proportion of fibrin in the carnivora and herbivora, taken in connexion with the nature of their food, furnishes any support to his views. Surely he must know full well, that the fibrin of muscular flesh is reduced back to the state of albumen in the digestive process, and that there is no difference between chyme formed from animal food and that produced by the digestion of vegetable substances, except that which depends upon the different proportions of its protein-compounds, its oleaginous matters, its saccharine and other constituents. So long as the food supplies albuminous matter in adequate amount, so long the proportion of fibrin in the blood is capable of being sustained; and, as we have just now remarked, we can see no reason why it should not be sustained, until all the albumen of the blood is exhausted. What is the explanation of the larger proportion of fibrin in the blood of herbivora than in that of carnivora, we do not pretend to say; but Mr. Simon's theory does not help him to accounting for it, since he will scarcely maintain that the disintegrating processes are more rapid in the former group than in the latter,—the very contrary, indeed, appearing to be the fact. It is to remembered, however, that little reliance can be placed upon the numerical proportion of this or any other of the elements of the blood, in estimating the

share which it takes in the formative processes. If the current doctrine be correct, there is a continual production of fibrin, and as constant a removal of it from the circulating current by the formative operations taking place throughout the body; and the amount which circulates in the blood may be considered as a sort of "floating balance," which affords no indication of the magnitude of the two sets of transactions which it serves to accommodate.

Such are the merits, in our apprehension, of the principal arguments assigned by Mr. Simon for abandoning the orthodox doctrine, and embracing the heresy newly imported from Germany. We trust that we are as much inclined as Mr. Simon to exchange old errors for new truth, provided the latter can be brought to our understandings; but we must be satisfied it *is* truth, before we abandon for it the doctrines that have been current among physiologists and pathologists ever since they began to reason correctly on such subjects. Of the objections which he raises to the current notions, on the basis afforded by the history of the ulterior development of fibrin, we shall not now stop to point out the fallacies.—*Brit. and For. Med.-Chirurg Review, April* 1851. *p.* 272.

ON THE ADVANTAGES OF AN ELASTIC CONVOLUTED SPIRAL BANDAGE, IN VARICOSE VEINS AND ULCERS OF THE LEG.

By James Startin, Esq.

Mr. Startin states that from the many hundreds of cases occurring before him annually, as Surgeon to the Hospital for diseases of the skin, he has observed the advantage of the convoluted spiral bandage over the customary mode of treatment. It is a modification of the plan recommended many years ago by Whately!

In the following brief remarks on this novel surgical appliance, it is unnecessary to insist upon the causes, or describe a varicose ulcer; suffice it, therefore, to say, that an inability to support the column of blood in the superficial veins, owing to the faulty action or destruction of their valves, constitutes the chief cause; and it is to supply this deficiency by the artificial substitute of a convoluted spiral strip of vulcanised Indian-rubber, which comprises the plan I am desirous of testing by professional experience and opinion. It may be well, however, to premise, that this treatment is especially advocated for those varicose ulcers only which are not complicated with extensive erythema, eczema, impetigo, psoriasis, or other disease of the skin of the leg, and that it will probably be found most useful in that varicose sore, so well characterised by Sir E. Home as "a species of ulcer which is seldom very deep; when it spreads, it is generally along the surface; its shape is commonly oval, the ends of the oval pointing vertically; the edges of the surrounding skin are commonly neither thick nor irregular, but are imperceptibly lost in the ulcer," &c.—(Home on Ulcers, p. 275). Yet it may be borne in mind, that, providing varicose veins are present, and other disease of the skin of the leg is not present, beyond the ordinary œdema or erythema surrounding nearly every ulcer, that the con-

voluted spiral bandage will exert a beneficial effect, and be found applicable; and this is the case whether the ulcer be round, oval, or irregular, deep or superficial, irritable or indolent, cicatrizing or sloughing, single or several, painful or otherwise; for this bandage interferes with no dressings or manipulations, nor does it conceal the wound, or hinder the application of any other roller, poultice, or remedy,—its sole office being to supply artificially the place and functions of the imperfect or deficient valves, and thus divide the column of blood as obtains in the normal condition of the limb; and I believe it will be found to accomplish this most desirable end most effectually, whilst, at the same time, it constitutes a cool and agreeable support for the leg, and removes that undue tension of the skin so commonly found complicated with varicose ulcers, by furnishing numerous *points d'appui*, and tending thus to prevent or avert those specific diseases of this membrane before referred to which are produced, or materially augmented by a tense state of its parts.

From what has now been stated, it will be understood that the convoluted spiral bandage may be combined with any other treatment, local or general, furnished by experience, or deemed advisable in the cases wherein the apparatus is to be applied; so that it may be regarded as an adjuvant rather than as the *sine qua non* of the treatment; and, when employed with this view, I have much confidence that its value will be generally allowed and appreciated. Before proceeding to describe it, however, it may be well to mention that, during its employment, lotions containing a little purified glycerine (℥ss. ad ℥viiss.) to prevent their drying, and slightly medicated with nitric acid, yellow or black wash, have in my experience proved more useful and suitable applications than plasters or ointments; and I prefer the following method of using these liquids:—A small piece of *bibulous paper torn from the sheet into the size and form of the ulcer* (the object of which is to furnish a soft, smooth surface, and to prevent the dressing sticking to the sore) is first to be wetted with the lotion, and then placed upon the ulcer so as barely to cover its edges; over this a pledget of lint or linen wet in the same solution is next to be laid, and this should be large enough to cover every portion of the discoloured or inflamed skin surrounding the wound. This dressing, when thus applied, may or may not, at the option of the operator, be secured with a turn or two of the common calico roller, wet with the same liquid; and over all is to be placed the convoluted spiral bandage, in the manner I will detail after having briefly described its nature.

This bandage may be manufactured of two or more qualities, according to the class of patient on whom it is to be applied, or the cost to be incurred; the best kind for ordinary use consists of half or three-quarter inch wide elastic band or webbing of vulcanized India-rubber covered with silk or cotton, two yards and a half long, or four or more yards in length, when the external saphena vein is to be supported to its entrance into the falciform opening of the fascia lata. At one end of this narrow band, a piece of strong silk binding, six or seven inches long, the ends of which are to be sewn together, is fixed obliquely, so as to form a sort of loop or stirrup into which the foot is to be placed; the other end of the band is sewn at right angles into the middle of a yard or more of

similar binding, which serves, after the fashion of a garter, to fix the bandage below or above the knee or round the pelvis when the spiral turns are completed.

This simple arrangement constitutes the entire apparatus ; the webbing or band of which it is composed costs from 1s. to 4d. per yard, according to whether the vulcanised thread constituting its foundation be covered with silk or cotton, or is finely or coarsely manufactured ; but another still cheaper and equally efficient method of constructing these bandages exists, which is also the one employed in my public practice ; this is, to take a piece of (No. 36) patent vulcanized India-rubber sheeting, of any width, and two and a half yards long, on which parallel lines half or three-quarters of an inch apart are to be marked, so that it may be accurately cut into strips of this width ; the incision should be commenced on these lines alternately, at a distance of three inches from each end of the piece, the object of which is to leave a portion of donble the breadth at the end of each bandage, so as to form a loop or stirrup for the foot, as before described. This wider portion of the bandage being properly fashioned, and an opening made in it, to fit the instep, either with scissors or a stamp made for the purpose, the apparatus only requires, to render it complete, a yard or so of cotton binding of the same colour as the vulcanized sheeting to be fixed at the opposite end of the band, as mentioned when the webbing is employed. The cost for each bandage thus constructed amounts only to sixpence or eightpence.

The method of applying the convoluted spiral bandage, and its effects upon the varicose veins and the sore, will be best understood by reference to the subjoined drawings, by my friend staff-surgeon Pilleau, made from a patient who had been under treatment with it for some few weeks. The case has been chosen, not so much to manifest the rapid improve-

ment of an ulcer of many years' duration and great extent, as to demonstrate the mode in which these sores heal, and the marked effect of the bandage in almost obliterating the appearance of the large varicose veins over which it is applied, and which has been represented without exaggeration or diminution.

From the sketch it will be perceived, that the loop of the bandage is first over the instep, so as to bring the commencement of the elastic band immediately under the outer ankle, which situation is to be preferred, although it can be applied under the inner ankle, should an ulcer or other peculiarity require it. In the plate No. 1, the ulcer represented in the lower third of the leg was originally of the usual oval shape, as will be seen from the part lightly shaded ; it was then fully double its present size, and the ends of the oval pointed vertically. These are now transverse, showing the usual effect of this bandage, but owing to the patient's neglect, and several days' standing at the "wash tub," the edges of the sore had become a little elevated, and the healing process had been slightly interrupted. On referring to plate No. 2, it will be seen that two turns of the spiral bandage are made before reaching the sore, the upper turn passing close beneath its lower border, whilst the next or third turn is taken immediately above it; the bandage being then obliquely continued at equal intervals of three quarters of an inch, to an inch or more, until it reaches the knee, where it is fixed by a turn or two of the binding acting as a garter.

This is the general arrangement which I have found it best to follow, as the long column of blood in the external enlarged veins by this means is divided into eight or more short columns, and, consequently, the capillaries of the ulcers are relieved to the extent of this division of the pressure upon them, while much of the tension is taken off the entire skin of the leg, by the blood being caused to pass inwards by the deeper veins, and collaterally by the smaller venous branches. From such a disposition of this simple contrivance, the parts concerned in the reparation of the ulcer are left in comparatively a normal state, and it is surprising how quickly reparation commences when no constitutional cause is present to interfere with the process. The means of cicatrizing in sores thus circumstanced, is, however, somewhat peculiar, and in deep ulcers much resembles what is seen in the reparation of the bone, *i e.*, the base of the ulcer often heals, leaving an indented cicatrix, the exact form of the sore remaining, as it were, impressed into the surrounding skin, as witnessed in plate (Fig. 1,) although it will be observed, that the lapse of a few months commonly serves to obliterate this appearance.

I trust, from the details now given, that most of the advantages of the proposed plan will become apparent; but there are a few not quite so obvious, which may deserve a passing remark, as they more particularly concern the poorer class of patients—this being more especially the poor man's bandage. The first is, that rest is unnecessary during the treatment, and the extreme ease and readiness with which the bandage may be put on the leg, and the pertinacity with which it retains its position under every motion of the limb, render it peculiarly applicable to this class of patients. The next is the facility that exists of applying poultices or the ordinary dressings of the wound, without

removing the bandage, all that is necessary in the former case being to put the poultice over the bandage, whilst in the latter, the lower spiral turn of the band next the ulcer, may be drawn from the leg, and the dressing put upon the wound, and then fixed in its position by letting the elastic band resume its place, when the same process may be repeated with the turn of the bandage immediately above the ulcer, by which means the ordinary tedious process of dressing is reduced to a minute's duration, and the varicose veins have the uninterrupted support of the bandage for any time that may be desired; ablutions, baths, &c. may also be used without disturbing, and with but very little hindrance from the bandage.—*Med. Times, March* 15, 1851, *p.* 285.

THE CHARACTERISTIC PECULIARITIES, PATHOLOGY, AND TREATMENT OF RHEUMATISM;

MORE PARTICULARLY AS IT IS FOUND PREVAILING WITHIN THE TROPICS.

By Dr. James Bird, A. M., London.

[In a paper published in the 'London Journal of Medicine,' (March,) Dr. James Bird, in consideration that the practice pursued in rheumatism, is undefined and somewhat empirical, one employing lemon-juice, another colchicum, and a third a purely alkaline treatment, without any explanation of the principles, or differences of diseased condition, on which such opposite systems of treatment are recommended, has studied the disease, as met with in Europe, and compared it with that prevailing within the tropics, among a class of patients subsisting almost exclusively on non-azotized articles of diet. The great prevalence of rheumatism, and the severity of some of its forms, both among Europeans and Natives in India, originating under atmospheric conditions and habits of life so different from those under which it is found prevailing in this country, seem well calculated to afford light into the nature of an obscure disease, which may be said to be protein in its modifications. Dr. Bird's observations are confined to three points. 1st. Leading varieties of tropical rheumatism, and the particulars in which rheumatic inflammation differs from simple suppurative inflammation. 2d. Origin of the rheumatic diathesis, nature of the paroxysmal fever accompanying articular inflammation, and causes which produce them. 3rd. The general principles of treatment.

Tropical rheumatism presents two principal forms, the stheno-phlogistic, or acute; and the astheno-cachexial or chronic. The former, in its attack of particular tissues, shows a preference for the compound membranes of a serous and mucous kind; the latter affects the muscular, nervous, and filamentous tissues, including the aponeurotic expansion of muscles and the periosteum, having much of a neuralgic character, and being accompanied by vitiated nutrition, and wasting of the parts affected. The very acute variety, associated as in Europe, with pericarditis, or endocarditis, is a form of the complaint seldom presented to observation in India; though cases in which the ordinary symptoms of heat, pain, redness, and swelling of the joints, accompanied by fever, are pre-

sent, occur both among natives and Europeans. Such attacks usually happen among those inhabiting the colder, dryer, and more elevated table-lands of that country. The astheno-cachectic varieties, associated with different forms of periostitis having all the character of mercurial syphilitic cachexia, are peculiarly the produce of malarious districts. Several interesting cases of these different forms are given, in illustration and proof that astheno-cachecic rheumatism, assiociated with arthritic periostitis, is a state of constitutional *cachemia ;* more frequently developed among the natives of India, than among Europeans after mercurial treatment. The proclivity of native constitutiona to this form of disease is said to arise from the more general use of non-azotized articles of diet by the natives than by Europeans ; giving to the former less vital power of resistance to the destructive metamorphoses of the tissues, brought on by cold, and abused courses of mercury. As cachexia advances in cases of this kind, attended by complication of rheumatic symptoms, the skin becomes harsh and dry, and is covered by white scales or papular eruptions, having all the character of obstinate psora. The intimate existing sympathy between the skin and epithelial covering of the intestinal mucous surfaces, is deemed to afford sufficient explanation of the occasional association of cutaneous eruptions with derangements of the primary assimilation and intestinal mucous surfaces, as observable in the different forms of arthritic complaints.

The intimate relation that subsists between milder and modified degrees of scorbutic *dyscrasia*, and the forms of astheno-cachexial rheumatism, is then pointed out. This connection has of late years been almost lost sight of, notwithstanding that the great and accurate observer, Sydenham, described a species of rheumatism resembling scurvy in its capital symptoms, requiring nearly the same method of cure ; and which he distinguished by the name of *sorbutic-rheumatism.* This species of the disease will be found under ordinary circumstances on shipboard, and among European sailors using in excess salt meat diet, with little or no admixture of succulent vegetables ; as well as among bodies of men on land, living on farinaceous seeds destitute of anti-scorbutic properties, or on a diet of unvaried character, with total abstinence from animal food. Such are the circumstances, aided by extreme aridity or dampness of climate under which land scurvy prevails among prisoners in the jails of India, and also among bodies of native troops in particular seasons and localities. The same unvaried farinaceous character of diet, used by many of our Sipahies, predisposes them to attacks of cachexial rheumatism. Several cases of this kind of scorbutic rheumatism are given in illustration, wherein lemon juice, with an allowance of potatoes and fresh meat diet, was found to be of much service in aiding the other means of cure.

The graduated forms of rheumatism just described, derive more of their difference from constitutional causes of distinction, and the less or greater aberration of the blood from its normal state ; and though the distinctions of the disease, according to its seat in various parts, are thought to afford less important grounds for opposite therapeutical principles, and modes of treatment, than the differences deduced from constitutional causes,—still the varieties founded on localities are deemed of importance as guides to practical results. The best description of such

varieties is considered to be that adopted by M. Chomel:—1st, articular rheumatism, or rheumatism in the joints; 2nd, muscular rheumatism, or rheumatism of the voluntary muscles; and, thirdly, visceral rheumatism, or rheumatism of certain fibro-serous tissues, situated within the splanchnic cavities.

The generality of cases belonging to the first form as met within the tropics, oftener present symptoms of the mild chronic variety than of the intense articular rheumatism of European climates; and though attacks are generally ushered in by febrile symptoms, these symptoms are of less severity than in colder climates, and the disease is less mobile in character. Muscular rheumatism, too, though observed in every part of the body, and usually more amenable to treatment than cases of the articular form, is more frequently met with in the loins and muscles of the lumbar than in any other part of the sarcous tissues. This is peculiarly a disease of malarious districts, being very prevalent among the men of native regiments when located in such.

Dr. Bird then proceeds to inquire whether the phenomena of rheumatism be identical with those of inflammation and the phlegmasiæ? Though rheumatism appears with all the phenomena of the latter, its local inflammation still possesses a specific character more symptomatic than idiopathic in nature, and manifesting in progress that the symptoms proceed from a particular constitutional taint, which gives to them a character distinct from simple inflammation. Rheumatism generally presents quite as much of the character *neuroses* as of the *phlegmasiæ*; and though evidence be not wanting to prove that acute articular rheumatism sometimes terminates in suppuration and purulent effusion into the joints affected, still rheumatic inflammation differs from simple inflammation, inasmuch as it proceeds from a specific cause and is associated with greater abnormal sensibility of the nerves.

Regarding the origin of the rheumatic diathesis, rheumatism is considered as the result of that pre-existing lesion of the assimilating and excretory organs of the body, which, on the application of cold, errors of diet, intoxication, malaria, and like exciting causes, gives rise to that abnormal change of the blood which constitutes the rheumatic diathesis. Sometimes the blood seems altered previous to the appearance of swelling and local rheumatic inflammation; but, occasionally, where the disease is produced by cold acting on constitutions little or not at all disposed to rheumatism, the altered condition of the blood probably follows the development of the local affection. In either case the heightened metamorphic power of the blood globules gives rise to greater relative formation of *fibrin* and progressive diminution of *hæmato-globulin* as they occur in rheumatic fever and its consequences. The natural tendency of rheumatism is to *anæmia*, and to the production of phenomena depending on a diminution of the blood globules, as lately prominently noticed by Dr. C. Ferral, in his observations on rheumatic cases with endocardic complications; where, after the employment of depletion and mercury, a cardiac bruit different from that which originally presented itself, continued to persist, notwithstanding the steady employment of means for subduing inflammatory action.

That morbid condition of the blood, which constitutes the *rheumatic dyscrasia*, occurs in all cases where the circulating fluid either becomes

deteriorated by the absorption of foreign poisonous matter, as in gonorrhœa, and in certain exanthematous diseases, accompanied by primary and secondary symptoms; or by the reversion into the blood of increasing morbid secretions, as in uterine affections that give rise to diseased conditions; which, though now fashionably treated as local disease by caustic and other like applications, are often, indeed, results of this very state of constituential *dyscrasia*.

The anatomical seat of rheumatism is peculiarly confined to the fibro-serous tissues, including articular capsules, cellular tissue, mucous follicles, synovial glands, the interior ligaments of joints, the muscles and tendons, the dura mater as reflected on the medulla oblongata and spinal cord, the pleura, the peritoneum, and nerve tubules. The localized manifestations of disease are accompanied, according to age, temperament, and previous habits, by almost opposite conditions of the blood, states of *hyperinosis* and *hypenosis*; which differences of constitutional cause give the rheumatic swelling of the joints more or less the character of ordinary inflammation. The local swelling of stheno-phlogistic rheumatism differs from ordinary inflammation in having more a character of irritation than the latter; but according to the researches of M. Andral, agrees wtih it in this that the fibrine in the blood increases from two-and-a-half or three to as much as ten parts in one thousand, oscillates in the sub-acute from between four and five, and returns to the natural standard in well marked chronic cases. This state of *hyperinosis* is, however, rather relative than absolute, being accompanied by a corresponding diminution of the red corpuscles; which, as Simon supposes, are wasted in the metamorphic production of the fibrine.

We come next to the treatment—on which subject Dr. Bird says—the general therapeutic principles to be followed in attacks of tropical and European rheumatism, are 1. To subdue constitutional irritation and fever by narcotics and refrigerants. 2. To eliminate from the system the retained cholæic elements, and other excrementitious matters of the blood, which render the urine acid, and occasion its lithic deposit. 3. To restore the conditions of normal nutrition by suitable diet in the stheno-phlogistic kinds and by iron, cod-liver oil, and tonics, when the rheumatic symptoms are associated with *cachemia*. 4. To subdue local symptoms of swelling and pain by leeching, cupping, and blisters, followed by anodyne applications, or local anæsthetics.

In order to fulfil the first indication which is the principal and leading one, in cases of the stheno-phlogistic kind, much professional discussion and difference of opinion have arisen, regarding the efficacy and propriety of general bleeding, as one of the means. The extent to which this remedy may be usefully employed, will depend much on the youth and naturally plethoric constitution of the patient, the inflammatory character of the local affection, the severity and tonic nature of accompanying fever, and the purity and bracing influence of the air to which the patient has been habitually exposed. The degrees of fever are found to correspond generally to the coldness and purity of the air in which the patient has lived, the azotized richness of his diet, and the proportionate *hyperinosis* of the blood accompanying good air and rich nourishment. In a general inflammatory diathesis, therefore, the propriety and efficacy of general bleeding are fully established by our own experience, and recommended

by a host of unexceptional authorities. But the natural tendency of rheumatic inflammation and fever being to produce anæmia, we must not be too prodigal in wasting the nutritive resources of the constitution; and should be guided in repeating the bleeding, according to the quantity and inflammatory firmness of the blood-clot, and the effect which the first bleeding may have had in subduing irritation and mitigating fever. The same extent of general blood-letting, that might be useful to the temperate and well-fed inhabitants of cold salubrious localities, would be highly injurious to the nervous, irritable, bodily habits, of those addicted to excessive beer drinking and other dissipated practices. The same quantity of blood, then, abstracted to cure quickly the plethoric mountaineer of Scotland, would endanger the life, or render tedious, the convalescence of an inhabitant of London, breathing an atmosphere deteriorated by sulphuretted hydrogen. The necessity, too, of general bleeding in tropical rheumatism is rather an exception than the rule, as might be expected from the comparatively mild character of its fever and inflammatory symptoms.

To carry out further this indication, after a moderate bleeding, recourse may be had to ten-grain doses of nitrate of potash, given along with small doses of tartarized antimony and citrate of potash, three or four times a day, in the form of effervescing draughts; or the nitrate of potash may be combined with nitrous ether and other diuretics; the intention in either case being to subdue heat and irritation, by restoring the normal excretory functions of the skin and kidneys. The utility of nitrate of potash seems dependent on its power of diminishing the plasticity of the blood and suspending the metamorphic disposition of the blood globules to produce fibrine. Under its use the specific gravity of the urine is increased, this being a medicine which possesses the power of eliminating urea and other compounds of lithic acid from the system. Such power is probably increased by the combination of nitrate of potash with other alkaline compounds, as the citrate and acetate of potah, which are converted into carbonates in the course of the circulation. All such means, however, prove refrigerant by subduing the heat and irritability of the body; and the effect of such may be greatly increased by the addition at bed time, of anodynes, either opium or aconite.

Of medicines best adapted to carry out the second indication, calomel and Dover's powder at bed-time, followed, next morning by a solution of sulphate of magnesia in compound senna infusion, with the addition of an alkali and colchicum, will be found among the most useful. Much misapprehension regarding the beneficial therapeutic action of the latter medicine seems to exist; some deeming its chief efficacy consists in its power of eliminating urea and uric acid from the system; while others deny to it any efficacy in subduing symptoms of true rheumatism. It is chiefly useful in cases of the acute disease, accompanied by a foul loaded tongue, biliary derangement, and intestinal mucous accumulation. Both our Indian and European experience has convinced us of the fact, that without its purgative effect being induced, the urinary secretion is seldom so much increased in quantity as to bring with it any considerable relief of rheumatic symptoms. The most beneficial mode of administering it in India is to give the wine of colchicum twice or thrice a day, in a weak solution of tartarized antimony, along with liquor potassæ, and tincture

of the hydrochlorate of morphia. Free action of the kidneys and skin is thus kept up, and the feverish frequency of the pulse reduced; but, even in such a case, the use of purgatives, and the elimination of the biliary secretion, must not be neglected or lost sight of. Where diarrhœa, or the purgative effect of colchicum is established, there the amount of urea and uric acid in the urine appears to be diminished; these compounds being eliminated, as would appear, by the intestinal evacuations. Dr. Bodeker, in a late minute examination of the action of various medicaments, with reference to the changes produced by them in the constituents of the urine, the exhalations of the lungs, and the blood, found that, contrary to the general opinion of pharmacologists, the use of colchicum produced but slight diuretic action, and had very little effect on the constituent parts of the urine. During its employment, the activity of the skin and lungs, in exhaling carbonic acid, is considerably augmented, and after a time its effect in causing an augmented secretion of bile becomes apparent; the melanotic blood globules, which are unable to combine with the oxygen of the air, being destroyed in the hepatic system, afford materials for an augmented secretion of bile. The result of his analyses, thirteen in number, on the action of colchicum and its known utility in rheumatism, seem to bear strongly on the truth of the opinions expressed as to the pathological nature of this disease.

The employment of calomel, with a view of obtaining its full purgative effect in cases of the stheno-phlogistic variety, should be more steadily pursued to carry out this indication than the plan of giving it with opium in order to obtain its constitutional effect. From its special action on the biliary organs, it is in Indian rheumatism an invaluable remedy; and in this country too, when properly administered in aid of colchicum and other purgatives, will be found of much utility, by depurating the blood, through increased biliary secretion, in those hypercarbonized states of the system associated with the disease in many of those cases met with in London. The practice of mercurial fumigation, as successfully used both in this country and in India, proves useful by increasing the elimination from the skin, and restoring the cutaneous functions to a normal state. The same result may be partially secured in both varieties of the disease, by means of warm bathing, warm clothing, and friction of the surface.

The third indication has more immediate relation to cases of the asthenо-cachexial kind than to those of acute rheumatism. The impaired state of the digestive function being so intimately associated with the origin and progress of the rheumatic constitution, it is of much importance, while carrying out the second indication, in acute varieties of the disease, that due attention should be given to the diet of the patient, which must be diluent and of easy assimilation. In the early stage of disease it should consist of gruel, thin arrow-root with milk, or weak broth; and if beef-tea be allowed, it may be given with the addition of twenty or thirty drops of liquor potassæ; the alkali serving to neutralize the lactic and other acids which accumulate in the stomach along with deceased mucous secretions. As phlogistic symptoms, even in the worst examples of acute Indian rheumatism, are associated with much destructive irritation and waste of tissues, a too active or injudicious employment of the diaphoretic and purgative treatment must be

avoided, as such will both derange the primary and secondary assimilation. Such derangement is marked by emaciation, loss of strength, pale anasarcous visage, and other signs of cachexia; and as the early appearance and rapidity of such symptoms are most remarkable in persons inclining to the leuco-phlegmatic temperament, the treatment for carrying out the two previous indications should not be such as makes too great a demand on the resources of the constitution. When cachexia appears, we must have recourse to the bark, sulphate of quinine, preparations of iron, or iodide of potassium, all of which operate beneficially on the constitution, by improving the tone of the organs of primary assimilation, modifying the nutrition of the tissues, and increasing the *hæmatine* of the blood. A combination of these several remedies may be necessary, according to the nature of particular cases; and where iodide of potassium, if given alone, would utterly fail in relieving symptoms, it may be usefully employed in combination with the bark, or sarza-decoction, or extract of taraxacum, by which the double effect of healthy cutaneous action and increased elimination by the kidneys may be generally secured. The iodide of potassium must not be given in large quantities, but along with it laxatives are as essential as in using colchicum. In many such cases, the compound decoction of sarza, to the extent, at least, of half a pint twice daily, with an equal proportion of warm milk, has been found to be of much utility in promoting the nutrition of the tissues and bringing back healthy cutaneous action. The extract of sarza pills, with resin of guaiacum and sulphuret of antimony may be given advantageously with the same object, care being taken to supply the patient with light easily digested elements of nutrition. Among such elements we may mention cod-liver oil, which in two cases, when prescribed in this country, proved of much benefit. One of these was a case of excruciating pericranitis, affecting the aponeuroses of the cervical vertebræ, and accompanied with neuralgia of the superior maxillary branch of the fifth pair of nerves; the other was hysterical neuralgia of the intercostal muscles. In both cases counter-irritation was employed by means of a liniment of oil of turpentine with pyroligneous acid over the pained parts; and in the former, the oil was given along with the extract of aconite at bed-time.

The last and fourth indication is to employ remedies suited to subdue the pain and swelling of the local affections. If such are of a musculer kind, strongly stimulating terebinthinate liniments, warm fomentations, and shampooing of the parts, will be found beneficial in relieving pain; but in some cases, such was its severity and persistence, that the patients were relieved by nothing except the abstraction of blood from the parts by means of cupping glasses. When the joints suffer, and are much pained and swollen, we found no local application more useful than leeches and repeated blisters to the parts. If the latter be employed, the blistered surface may be dressed with an ointment containing small quantities of the hydrochlorate of morphia, or extract of belladonna. The application also of a wet bandage, saturated with a lotion of camphor mixture, wine of colchicum, and tincture of the hydrochlorate of morphia, covered over by cotton wool and a piece of spongio-piline to prevent evaporation, will be found of much utility. Others have of late recommended for the same purpose a chloroform lotion, or one of Dutch

liquid, stating such to be of great utility in relieving the pain and swelling of the joints; but though we have had no experience of their efficacy, they appear well calculated to fulfil the same intentions as other like remedies which have been long in use. More might be said as to the greater or less efficacy in rheumatism of special remedies, but as we place little faith in such when used without discrimination, we defer any such remarks to a more fitting opportunity, the great object of this paper being to delineate the leading characters of rheumatic disease, and the therapeutic indication most applicable to each.]

ON BURNS AND SCALDS.

By Samuel Crompton, Esq., Surgeon, Manchester.

[In a report on burns and scalds, drawn up for the Provincial Medical and Surgical Association, Mr. Crompton has given a complete abstract of those papers on this subject which were received by him from the practitioners of the provinces, most of which had already been printed *in extenso* in the 'Provincial Medical Journal,' and of some of which an abstract has been given in previous volumes of this 'Retrospect.' Mr. Crompton's abstract is interspersed with such reflections as have arisen in his mind on this important topic during the years 1847-8-9 and 50. He begins by giving a list of the names of those gentlemen who contributed the information on which the report is founded; he then states that "the real object of the inquiry was not to elicit a series of papers containing entirely *new* views, but to ascertain which of the numerous plans of treating burns, recommended in systematic treatises, are adopted by the profession, and what are the prevailing views respecting their value." He then directs attention to the frequency of burns in the provinces, and to the large experience which provincial practitioners must necessarily have of these accidents, and consequently, how valuable must be their opinions on their treatment. He speaks of the materials placed at his disposal by his professional brethren as "constituting a mass of practical information of very great value," and proceeds with his report. He objects to the received classifications as burns as being calculated to mislead the practitioner, and for not taking into account the three most material points, viz.: the immediate effects produced on the constitution of the patient, and the superficial extent of the burn. He proposes a classification based upon these points, which he says are essentials of a good practical classification. If any influence is brought to bear upon the human body, and produces effects which are not compatible with the easy and due performance of the vital functions, the nervous system has the power of so adjusting the action of the injured parts, or of those which are adjacent, as to compensate for the mischief, by either restoring the part to health, or making its loss or injury as little prejudicial as may be. So in a kingdom, if an insurrection takes place in (we will suppose) some distant part, the local authorities, holding their power from the higher, may, if it be of small extent, suppress it without requiring the help of the central government, and the latter may scarcely feel it or be

affected by it ; but if the magnitude of the danger be such as to require greater force for its removal, the central or governing power may be so far affected by it as to be paralysed, or it may feel the magnitude of the danger so acutely as to be roused to the most strenuous action, everything else being set aside except the suppression of the insurrection. So it is in the body : if the injury done by a burn be—

1. Local; that is of so small an extent as not to affect the nervous centres so as to produce any of those symptoms which are usually spoken of under the generic term *shock ;* the adjusting power of the parts adjacent to those injured, seems to be nearly sufficient to repair the mischief, and what the nervous centres contribute does not interfere with their other relations. In these cases, the pain from the burn is usually very severe ; the patient acts for himself, his perceptions and sensibilities are neither lessened nor prevented, nor is the circulation much quickened or depressed, nor are there shiverings. But if the mischief done to the injured part be of greater importance, the condition of the system is the best, and certainly the only sure guide to us in judging of its gravity. Here the local affection is secondary in importance, and the management of the burned part is to be regarded less than the derangements of the nervous centres, and the train of symptoms which immediately begin to spring from the shock communicated to them. These, it seems to him, form a distinct class, which may be termed.

2. Constitution, or vital burns, which are capable of several divisions according to the severity of the constitutional symptoms. Shivering (though not enumerated by Dupuytren among the effects of burns) is one of the most striking features in cases which come under the observation of English surgeons ; and it seems to Mr. C. to be the most important of the early symptoms as a guide in shewing whether, or how far, the constitution suffers from the burn. If the pain in the burned part is complained of as a very severe burning pain, and there is *no shivering*, the case is generally one which will recover. If, however, there is shivering, and the patient does not seem to suffer much burning pain in the part, there is danger ; and the treatment must be mainly constitutional. In proportion to the severity of the shivering, and the frequency of its recurrence, will usually be the danger of the burn. Hence, then, the importance of the existence of shivering, and its recurrence as a test of the severity of a burn; and, therefore, as a line of demarcation by which we may separate those cases which require *constitutional* treatment chiefly, from those which require merely *local* treatment. It is curious that, as a result of the application of heat to the body, it should be possible to draw such a distinction, as that one class of cases should be complaining of the intense heat in the injured part, whilst the other class should be shivering. Mr. C. adds that it is probable that the conflicting and perplexing statements respecting the efficacy of remedies in burns, depend mainly on this difference in the condition of the system. If there be the feeling in the part of burning heat, we can understand how cold applications would be grateful; and further, how the case would get well, even though they were not the best, for the powers of the nervous system are inact. But surely no one would recommend the continued application of cold to a patient labouring under the depression and shivering attendant upon a severe burn.

Another novel view started in this report, has reference to the principle on which external applications to burns are beneficial. It has generally been held that they do good chiefly by *excluding the atmospheric air*. Mr. Crompton considers this explanation to be unphilosophical. It appears to him to be incorrect to regard the air which we can take into the minute texture of our lungs as an irritant to an external sore. If the air is as injurious to the skin when it is excoriated (as it is commonly supposed to be) might it not be expected that it would be *very irritating* to a mucous membrane, even when in a healthy state? But it is not so; and further, if the air which passes over an inflamed mucous membrane be *warm*, it does not appear to harm it; but when the air is exceedingly cold, it does harm, not only to the inflamed but to the healthly mucous membrane, especially to the lining of the respiratory organs. As an example of the irritant effect of cold air on the healthy mucous membrane of the nostrils, he instances the increased discharge of mucus from them on a frosty morning, and the pain which is then felt when the cold air first enters the nosrrils immediately after sneezing or blowing the nose. In warm weather, the air produces no such painful effect. He concludes, therefore, that it is the accidental circumstance of its coldness which is pernicious. Air of itself, *air as air*, produces no irritation; but *cold* air, that is air destitute of a given proportion of caloric, produces much irritation. Bearing in mind the analogy which exists between skin and mucous membrane, it can hardly be supposed that air will be more injurious or irritating to the skin than it is to the mucous membrane of the respiratory organs. And if *warm* air can continually pass in a current, and in large quantity, over the inflamed mucous membrane of the mouth, nostrils, or bronchi, without producing much irritation (if any), can it be supposed that air, if warm, does harm to any sore or wound of the skin? Is it not more just to suppose that it is the fact of its possessing a greater or less amount of sensible heat which renders it injurious or the contrary? By appealing to the process of nature in the healing of wounds, he finds a confirmation of these views: blood or serum coagulates upon a wound, and forms a dry scab, which is not only an excellent mechanical defence to the sore, but a powerful non-conductor of heat. There is a close agreement between what we observe of this process of nature and the results of experience; for surgeons take as the basis of their dressings such animal and vegetable substances as are known to be the best non-conductors of heat, e. g., spermaceti, wax, suet, resin, animal and vegetable fixed oils, insinglass, mucilage, &c. So exact is the agreement between theory and practice that, according to Dr. Duncan, the three classes of outward applications—"ointments, cerates, and plasters, are *all* combinations of fixed oil or animal fat with other substances;"—that is to say, their basis consists of those substances which in the living animal or vegetable resist sudden changes of temperature, and, in the former, play a most important part in the maintenance of the animal heat. Such external applications as lint, simple poultices, and the water-dressing, do not appear to be exceptions to this law, as he tries to prove. He does not however, attribute all their efficacy to their non-conducting power, for he states that, for the most part, they are also idioelectrics and non-conductors of electricity: circumstances probably of much importance. Neither is it to be inferred that he holds that non-

conductors do good by imprisoning the animal heat ; for he mentions that though they are non-conductors, yet that they have a large capacity for heat ; that they serve to preserve uniformity of temperature in the injured part, and tend to soothe the nervous irritability of the injured part, by preserving the nerves from feeling the variations of temperature in the currents of air which would act upon the surface. If the view which he takes be correct, *the thermometer becomes an important instrument in determining the therapeutical value of external applications ;* and the scepticism entertained by some respecting the value of cotton, treacle, flour, &c., is shown to be unphilosophical.

Our space will not permit us to give further extracts at present. In a future volume we hope to give more, and we must refer our readers to our present synopsis of treatment for future information.]

PART FIFTH.

MISCELLANIES.

Extract from an interesting book called Physic and Physician.

Chapter I.

It is not our intention, however interesting the subject may be, to travel over the ground which has been so ably explored by the master minds of Friend, Le Clerc, Lettsom, Schulze, Hamilton, Moir, and Bostock. Were it necessary to write a history of medicine, we should have but little difficulty in effecting our object, assisted as we should be by the elaborate works of the abovementioned authors. They have penetrated into the most secret recesses of ancient history, and have recorded, with a praiseworthy accuracy, the progress of opinion among the medical sages of antiquity. Much good has undoubtedly resulted from enquiries of this nature. The man who is conversant with medical history must be aware how often time and talents have been misspent, not only in the defence of deceptive theories, and erroneous modes of practice, but in the account of alleged discoveries, which have proved in fact, to be only revivals of doctrines once supposed to be valuable, but long ago exploded as unimportant and useless. It is not only necessary, therefore, to be acquainted with the system which obstains for the time being, but to have at least some notion of the views which regulated the treatment of diseases in by-past ages ; else, like the mill-horse, we may work in a circle, tread the same ground over and over again, and leave matters just where we found them. Without this knowledge a practitioner, however observant and wide the range of his personal experience, must ever remain only half informed ; for although medicine is, perhaps, beyond all other arts and sciences essentially practical,

and books, without experience in the treatment of disease, can never form the real physician, yet the most valuable deductions are those which are confirmed by an extensive comparison of what is seen with what has been read.

The farther we attempt to penetrate into the mystery of antiquity, the more indistinct does the object of our pursuit become. In place of the certainty which we might have anticipated from a nearer approximation to the head of the stream, we experience increasing perplexity ; and where we might hope for the guidance of truth we find ourselves embarrassed by the delusion of fable.

Le Clerc discusses with considerable ingenuity the question, "*si la médicine est venue immedealement de Dieu* ?"—whether medicine came immediately from God.

In Ecclesiasticus (Chap. xxxvi, v. 12) it is said, that "God created the physician and the physic, and that he hath given science to man, and that 'tis he that healeth man, &c." All the ancient pagans held their gods to be the authors of medicine. The art of physic, says Cicero, is sacred to the invention of the immortal gods : "*deorum immortalium inventioni consecrata est ars medica.*" Pliny makes a similar declaration, "*Diis primum inventores suos assignavit medicina cæloque dicavit.*" In the works of Galen, it is said, that the Greeks ascribed the invention of arts to the sons of God. Hippocrates makes god the inventor. He says, "they who first found the way of curing distempers, thought it an art which deserved to be ascribed to the gods ; which is the received opinion."

Celsus, the elegant Roman physician, has asserted that medicine and mankind must have been coeval in their origin : "*Medicina nusquam non est ;* an opinion which we think cannot be rationally questioned. If some nations, says, Pliny, have made shift without physicians, yet none ever did without physic. The learned Schulze seriously maintains that the first man must necessarily have been the first physician. He considers that our first parents were skilled in physiology. Let the curious reader, refer to his work for his reasons for holding this opinion : we do not think this is the place for the discussion of his arguments.

Our medical knowledge of the antediluvians is very scanty. After the deluge, we read of circumcision being performed ; and with the solitary exception of this surgical rite, history, whether sacred or profane, presents us with no information whatever respecting the progress of medicine or surgery, during the patriarchal ages. As we descend the stream of time, and approach the limits of authentic history, we find that the science of medicine was cultivated methodically, and reduced to a system.

Herodotus informs us of the state of the science among the Babylonians. The practice of medicine must have preceded the reduction of the art of healing to scientific principles. The Babylonians and Egyptians carried their sick into the market-place and public streets, in order to obtain the experience of those who might pass them, and who had been afflicted with the same diseases ; and no one was allowed to pass until he had investigated the sick man's case. This was not only the practice of this nation, but was one of their public laws ; and

Sozomones mentions it as obtaining amongst the Hiberi, a people in Asia. The prophet Jeremiah feigns Babylon complaining, in the Lamentations, in these words, "*Is it nothing to you, all ye that pass by,* behold and see if there be any sorrow equal to my sorrow:" and then the Apostle Mark, (chap. vi.) in allusion to the same custom says, "And whethersoever he entered, into villages and cities, and countries, *they laid the sick in the street,* and besought that they might touch, if it were but the border of his garment; and as many as touched him were made whole." Strabo says the same of the Portuguse, "who, according to the ancient custom of the Babylonians and Egyptians, bring their sick into the streets and high ways, that all comers who have had the same malady, might give them their advice." Notwithstanding this circumstance, the Egyptians, a people much resembling the Chinese, were the most forward of the primitive nations, in the march of civilization and the cultivation of knowledge Manetho, a distinguished Egyptian writer, is represented by Eusebius as stating that Athatis, a traditionary monarch of that country, wrote several treatises on anatomy. In Egypt, medicine was fettered by absurd regulations. The chief priests confined themselves entirely to the exercise of the magic rites and prophecies, which they considered the higher branches of the art, and left the exhibition of remedies to the *pastophori,* or image-bearers. They were also compelled to follow implicitly the medical precepts of the sacred records contained in the six hermetical books: a deviation from those rules was punished with death. The Egyptians and other Eastern nations who first cultivated science, cherished a great veneration in the earliest periods of time for the medical character; and the ancient Greeks, who were less advanced in civilization and the refined arts than the Trojans, never mentioned their professors of medicine but with the warmest gratitude and veneration. The Argonautic expedition was not undertaken without the attendance and aid of a physician, even the divine Ex, who was considered one of the principal heroes of the school of Chiron the Centaur. The history of Machœon, his son, exhibits a character adorned with most amiable virtues. When he was wounded by Paris, at the siege of Troy, the whole army appeared interested in his recovery. Even Achilles, during his seceding from the allied army, when he had

> His friend Machœon singled from the rest
> A transient pity touched his vengeful breast;

and he dispatched Patroclus to inquire afrer the wounded offspring of the healing god," who was placed under the protection of the wise Nector at the request of Idomeneus, who observes,

> "A wise physician, skilled our wounds to heal
> Is more than armies to the public weal."

The Jews were ignorant of medicine until their introduction into Egypt.

The Grecians, like the Egyptians, considered medicine of divine origin. Their Apollo and Minerva, answered to the Ises and Osiris of the latter nation; and Orpheus, the priest, poet, and physician usurped the place of Thoth.

Esculapius flourished fifty years before the Trojan war; and we find that his two sons distinguished themselves in that war by their valour,

and by their skill in curing wounds. Homer, describing Eurypylus wounded and under the care of Patroclus, says,

> " Patroclus cut the forky steel away,
> When in his hand a bitter root he bruised,
> The wound he washed, the styptic juice infused,
> The closing flesh that instant cease to glow,
> The wound to torture and the blood to flow,"

Hippocrates, who has justly been styled the " Father of medicine," was born in the island of Cos, situated in the Egean sea, at no great distance from Rhodes. Celsus remarks, that Hippocrates was the first person who emancipated medicine from the trammels of superstition and the delusions of false philosophy. He considered the doctrine, inculcated by physicians, of the celestial origin of disease, as paralysing the efforts of the physician, and proving highly detrimental to the patient. While the vain hopes it held out of recovery, through the medium of prayers, sacrifices, and bribes for the intercessions of priests, could not fail to bring both religion and medicine into contempt. His works which have descended to us, are very much contaminated by interpolation. He died at the age of 100, three hundred and sixty years before the birth of Christ.

Contemporaneously with Hippocrates lived Democritus of Abdera, a zealous anatomist. Thessalus and Dacro, two sons of Hippocrates founded, with Polybus, his son-in-law, the Dogmatic School. Their leading tenets are recorded in the book, " On the nature of man." This school applying, or, rather misapplying, the mystical speculations of the Platonian philosophy to the study of medicine, adopted this most pernicious principle, that, " when observation failed, reason might suffice." Their doctrine was utterly subversive of the first principle of that illustrious reformer, who, by bringing every fact to the test of the most rigorous observation, and ridding the science of medicine of the gross absurdities which had so long disfigured and perplexed it, succeeded in extricating it from the chaos of confusion in which he found it involved, and elevating it to its true rank among the higher branches of human knowledge.

Contemporaneously with the establishment of the Dogmatists, Eudoxus founded the Pythagorean system, the disciples of which directed their attention principally to the dietetic part of medicine.

Then followed the Empyrical school, relying solely on facts, and setting principles entirely aside, in their estimation of disease and administration of remedies.

The establishment of the Alexandrian sect formed an important epoch in the history of the medicine. Erastratus and Eraphilus were the first physicians of note in this school. But we have to regret that the destruction of its splendid library, by the hands of the barbarous conquerors, has left us little to relate concerning its doctrine or practice.

Pliny informs us that the Romans were 600 years without physic,if not without physicians. All operations in surgery were performed by slaves and freedmen. The first man who practised at Rome, as a regular man, was Archagathus, a Greek. The too frequent use of the knife, and the actual cautery, caused him to be banished from the capital of the Roman Empire."

GENERAL ORDERS.

APPOINTMENTS.

6*th September*.—The undermentioned Medical Subordinates are warned for examination before the board of Medical Officers at the Presidency about the 23rd December 1851.

Acting Apothecary J. North.
Second Apothecary P. Macintyre.
Assistant Apothecary W. McLean.

11*th September*.—Assistant Surgeon W. H. Boutflower is permitted to enter on the general duties of the Army.

23*rd September*.—Assistant Surgeon Henry Stanbrough Civil Surgeon of Masulipatam to act as Surgeon of the 4th District during the absence on Sick Certificate of Surgeon Hugh Cheap M. D. or until further orders.

Assistant Surgeon J. Crawford has been appointed as Civil Surgeon of Masulipatam until further orders.

Assistant Surgeon J. Wilson is permitted to enter on the general duties of the Army

POSTINGS.

5*th September*.—Assistant Apothecary H. Fisher from Artillery at Aden to do duty 1st N. V. B.

Assistant Apothecary C. E. Newland from doing duty 1st N. V. B. to Artillery at Aden.

Assistant Apothecary S. B. Kemp from Tavoy to Superintending Surgeon's Department Presidency Division.

11*th September*.—Surgeon J. Hamlyn of the 34th L. I. and R. H. Rennick of the 26th N. I. are at their own request permitted to exchange Corps—the exchange to have effect from date of arrival of the Head Quarters 26th N. I. at Maulmein.

Assistant Surgeon J. A. Horak M. D. from d. d. 48th N. I. to 48th N. I.

15*th September*.—Junior Medical Apprentice R. G. Wright from doing duty Dispensary 2nd District to do duty Medical College.

20*th September*.—Assistant Surgeon S. G. Williams posted to 19th Regt. N. I.

27*th September*.—Surgeon C. Paterson M. D. to 44th Regt. N. I—to join on being relieved from his present appointment.

LEAVE OF ABSENCE.

5*th September*.—2nd Apothecary P. Crummy, Pension establishment, in continuation from 14th September 1851 for 12 months—Neilgherries and Mysore.

12*th September*.—2nd Apothecary C. Dashwood 1st Madras Fusiliers from 1st September 1851 to 29th February 1852—Bangalore and Eastern Coast s c.

Assistant Apothecary J. Bartley d. d., 1st Madras Fusiliers from 1st Septr. 1851 to 31st October 1851—Northern Division and Eastern Coast.

Assistant Apothecary E. Thompson 2nd European L. I. from 28th August 1851 to 1st August 1852 Masulipatam s. c.

16*th September*.—Apothecary R. Thompson Medical Department from 1st October 1851 or from date of leaving Baitool to 31st March 1851 Bangalore and Madras.

Assistant Apothecary W. Powell Medical Department from 1st November 1851 to 30th April 1852 Madras.

Apothecary W. King Pension Establishment from 22d September 1851 for 3 months—Madras.

26*th September*.—Assistant Apothecary S. Sausman 7th Regt. N. I. in continuation till the 15th December 1851—to enable him to join.

PART FIRST.

ARTICLE I.—*The Urine in Health and Disease.* By Senior Student D. KARNEY, Medical College.

The urine in health.—Nature has endowed man with a very complicated urinary apparatus, consisting of two secreting organs denominated *kidneys,* two elongated tubes each about eighteen inches in length called *Ureters,* adapted to convey the urine after its formation into an elastic membranous receptacle named the *Bladder,* from which it is subsequently thrown out of the system by the agency of the muscles, through a membranous canal familiarly known to anatomists as the *urethra.*

The urine is an excrementitious saline liquid, by means of which the system is freed of certain effete and deleterious matters which have a peculiar tendency, when retained in the blood, to produce many alarming and fatal diseases ; particularly one of the constituents viz. azote or nitrogen, an important elementary body.

Normal human urine when recently voided, is a limpid, amber colored, or light yellow fluid, possessing a very peculiar odour, a disagreeable saltish taste, and a consistence slightly thicker than water, having in solution a large quantity of saline ingredients. It has a slight acid reaction, a specific gravity greater than that of water, and is of the same temperature as the blood,—averag- ing from 98° to 100° F.

The *color* of healthy urine may vary according to circumstances; when evacuated in small quantities, it is generally high-colored, and when discharged abundantly it is usually pale and somewhat increased in transparency.

The nature of the *colouring matter* contained in the urine is involved in great obscurity, and has led to much controversy among chemists. Dr. Prout, one of our best authorities on this subject, has attributed it to a resinous principle, similar to the *resin of bile.* Physiologists have usually considered it to be dependent upon the existence of two very different coloring principles, a red, and a yellow ; but we are inclined to doubt the existence of the former, for we have never seen healthy urine present any tinge of red, except when certain medicinal agents have been employed.

The *odour* of the urinary secretion is subject to various alterations;

the urine loses its natural smell when voided in large quantities of a pale color, and the odour is augmented considerably when the urine is scanty and high colored. The urine suffers changes in odour also when extraneous substances are present in it. Various articles of diet have also the power of effecting a change in the normal smell of the urinary secretion.

Urine on becoming cool assumes an ammoniacal odour, which by degrees merges into what has been appropriately denominated urinous, being common to no other secretion; it then participates in those properties which characterize the generality of alkalies; these changes are evidently due to the decomposition of the urea, and the consequent separation of ammonia.

The urine when subjected in an open vessel to the action of atmospheric air, undergoes various changes; at first a cloudy precipitate is formed, which gradually increases rendering the fluid perfectly opaque, and on the surface of the fluid is perceived a crystalline layer; subsequently the urine regains its transparency, and assumes a brownish or yellowish hue, with an alkaline reaction; at length a brown grumous looking deposit, is seen at the bottom, with innumerable white particles, consisting of crystals of the ammonio-magnesian phosphate in combination with amorphous phosphate of lime, and mucus, so conglomerated as to resemble in its general appearance, a small soft calculus.

There is no fluid in the whole body so susceptible of putrefaction as the urinary secretion. In tropical climates, if this liquid be subjected to exposure in the sun's rays for a few hours, it speedily becomes black and remarkable for its turbidity, deposits a sediment, and exhales a very offensive smell, much like the fetor evolved from malignant cancerous affections.

Normal human urine is divided generally for convenience of description, by most authors, into three kinds, viz. 1st, *crude, urina chyli vel cibi, the urine of food,* 2nd *cocted, urina sanguinis,* or *the urine of blood* and 3rd, *urina potus,* or *the urine of drink.* The former of these is secreted one or two hours after a full meal, and is characterized by containing a greater proportion of solid constituents, while the two latter are usually nocturnal productions, being formed at a time when no food has been introduced into the stomach, and are more particularly distinguished by being largely diluted with water; they have also comparatively speaking a lower specific gravity.

Density.—No secretion is liable to such numerous changes of specific gravity in the short space of twenty-four hours, as the urine.

Both the solid and watery constituents are materially influenced by many incidental circumstances. In the scorching months of June and July in this country, a very small quantity of this fluid is secreted in a day, and during the monsoon a proportionately larger amount; this variation is easily accounted for by the simple fact, that the aqueous portion of the blood is conveyed out of the system through the integumentary pores, as perspiration during the former period, while there is little of that fluid excreted by the skin in the cold season. Sedentary and indolent habits of living always induce a diminution of the ordinary healthy specific gravity. Certain acid beverages, alcoholic liquids, watery and vegetable diet, &c. have also a tendency to decrease the density of the urine; while on the other hand, the density is increased by free cutaneous excretion, excessive muscular exertion, and by a dry animal diet. The specific gravity of the urine is somewhat greater in the male than in the female. The density of healthy urine may be said to range from 1·014 to 1·024; and to average 1·020 at different periods of the year.

The urine best calculated for analytical purposes is that secreted during the night and eliminated in the morning, which is then uncombined with dietetic particles, and in a condition uninfluenced by exercise, or any other circumstance having a liability to effect the least modification, and thus act as an obstacle to the discovery of the normal ingredients of this liquid. The urine is a fluid very difficult of analysis; several attempts have been made to analyze it, but the relative proportions of the different constituents have not yet been accurately determined.

The amount of urine secreted in a day varies according to the quantity and quality of the fluid taken, as well as to the proportion of cutaneous excretion eliminated in twenty-four hours. Physiologists of all ages and countries, have differed in their individual opinions relative to the quantity excreted daily, but the average as noticed by Dr. Prout, was considered to be in Britain 30 oz. during summer and 40 oz. in winter. The amount of solid matter thrown out of the system by the agency of this secretion during 48 hours, has been ascertained to be 5 oz. avoirdupois, of which the urea is reckoned to equal $2\frac{1}{3}$ oz.

The inhabitants of the frigid and temperate climates secrete a much greater quantity of urine, than those residing in the tropics; the cause of which has been already attributed to the secretion of the skin which is considerably mitigated and influenced by cold.

The following are some of the circumstances which influence in a

very extraordinary manner the production of the urinary secretion.—

1st *Certain beverages* have a tendency to diminish the quantity and quality of the urine by possessing diaphoretic properties ; while others from their diuretic effects augment the secretion.

2nd *Muscular Motion* and *Exercise*, induce a partial suppression of the urine, by determining blood to the integument, and as a matter of course, by promoting the functions of the sudoriparous glands, and sebaceous follicles.

3rd *Certain Mental Affections*, particularly fright, have been known to render the urine inordinately pale and abundant.

The urine of the fœtus is devoid both of taste and smell, and its consistence is much more watery, from containing a smaller proportion of solid ingredients. If subjected to careful and cautious evaporation, some cubic crystals possessing nearly all the properties common to hydrochlorate of ammonia, will be found deposited among the other salts.

Urine reddens litmus paper, and must therefore contain an acid, which has been generally supposed, both by ancient and modern Chemists to be due to the existence of *phosphoric acid*, but Thenard a renowned physiologist and chemist has proved by some decided and able experiments that it is in reality the *acetic* ;—Liebig, if we mistake not, ascribes the acidity of this secretion to lithic or uric acid.

If urine be allowed to evaporate spontaneously it becomes frothy ; this remarkable phenomenon has been attributed by Prout to the evolution of carbonic acid. Urine when evaporated by the aid of a gentle heat to a syrupy consistence, exhibits a layer of crystals bearing some resemblance to common salt or the chloride of sodium.

If an ammoniacal solution be added to recently voided urine, a whitish precipitate possessing all the properties of phosphate of lime will result.

When fresh urine is cooled it occasionally deposits a brick colored substance, first discovered by Scheele, by the aid of the microscope, to be crystallized Uric acid.

By the addition of hydrochloric acid to fresh urine evaporated to the consistence of a syrup, a precipitate will be formed closely allied to benzoic acid.

When urine is evaporated and the urea separted from it by means of alcohol, a saline substance will be obtained, known as *microcosmic salt*, which after patient investigation is found to be composed of the phosphates of ammonia and soda.

Healthy urine when heated to the boiling point remains unaltered, and is also unaffected by any of the mineral acids. By the addition of

oxalic acid a slight nebulous deposit will be the result; this is the oxalate of lime. All free alkalies will precipitate the phosphate of lime.

When an infusion of tannin is dropped into urine, a white precipitate is formed, possessing all the characteristics common to gelatine; this very circumstance, has probably induced many analysts to consider gelatine, as one of the normal constituents of the urine.

When rhubarb, madder, cherries, logwood, and prickly-pear the fruit of a species of cactus, are taken internally, the natural color of the urine, becomes changed to a bright yellow or blood red; this latter appearance of the urine, has often been mistaken for hæmaturia by medical men.

The inhalation of the vapor of turpentine and the use of rosin, have been known to convert the normal color of the urine into that of violet.

An extremely nauseous and disagreeable odour resulting from the administration of asparagus as a medicinal agent is familiarly known to physicians.

When urine is preserved in new casks, some small efflorescent crystals will be deposited, bearing some analogy according to Dr. Prout, to the carbonate of lime.

Chemical composition.—The three most important principles of the urine are water, urea, and uric acid. There are numerous other ingredients entering into its composition, the chief of which are the biphosphates of ammonia, soda, lime and magnesia, sulphates of potash and soda, chlorides of potassium and sodium, fluoric and benzoic acids, lactate and acetate of ammonia, fluoride of calcium, hydrochlorate of ammonia, sulphur, silica, mucus and some colouring and animal extractive matters. Albumen, and a fatty oil called kiestein, have also been found in the urine of pregnant women, and though these are matters foreign to it in healthy conditions of the system, still, from their not producing any diseased changes in that liquid, they ought to be considered as occasional or simply accidental constituents.

Water,—Exists in the greatest abundance in this fluid. In a thousand parts 933 have been ascertained to be composed of water, and the remaining 67 of solid constituents. This quantity is essentially necessary, to retain the salts in a state of solution.

Urea,—Exists naturally in urine, forming its principal constituent, and is analagous to a cyanate of ammonia; it can be obtained artificially by acting upon dry ammonia by the vapour of cyanic acid and water, then by digesting and crystallizing.—Urea, the formula of which is $C_2\ H_4\ O_2\ N_2$, can be obtained from normal urine, by subjecting it to evaporation, till it becomes converted into a

thin syrup, and by the addition of an equivalent volume of nitric acid unadulterated with nitrous acid, crystals of the nitrate of urea are formed, which if dissolved in water, neutralized by potash, evaporated to dryness, and (after separating as much saltpetre as possible) acted upon by alcohol, the urea is then held in solution; evaporation and crystallization complete the process for the formation of this important nitrogenous compound. Urea is prismatic in shape, resembling saltpetre in its general appearance and taste. By the application of heat, ammonia is evolved. It can always be dissolved by alcohol or water. It has been classified among the organic bases, because it forms compounds with acetic, nitric, and oxalic acids. If urea be acted upon by strong acids or alkalies, and then subjected to the effects of heat, carbonate of ammonia is the result. Hyponitrous acid has the power of resolving it into ammonia, water, nitrogen and carbonic acid gas. Pure urea is almost colourless, and when in an impure condition is easily recognized by its yellow or brown color. It has a cooling, saline taste, is perfectly inodorous, deliquescent and has neither acid, nor alkaline properties. It is supposed to derive its origin from two very different sources; partly from the nonassimilated principles of azotiferous food, existing in combination with the blood, and partly from the disintegration of the nitrogenous animal structures. It has been found ready formed in the blood in certain diseased conditions, but has never been detected in that fluid in health; this fact has been accounted for by the urea being separated immediately after its formation.

Uric acid.—Known also under the appellation of lithic acid, was so named from being first obtained as a constituent of urinary calculi. It resembles wool in its general appearance, and was discovered to form one of the principal ingredients of those gouty concretions, commonly known as chalkstones. Its formula is C_{10} H_4 N_4 O_6 and was supposed by some to exist uncombined in the urine. Dr. Prout states that it has been found as urate or lithate of ammonia, and Liebig as urate of soda. It is an azotiferous compound, and exists in very small proportions in the human urine; 2000 parts of that liquid containing only 1 of lithic acid. It is still undecided as to the particular state, (solid or fluid) in which it exists from its slight solubility in water. Dr. Prout supposes that it has its origin from the albuminous tissues, and Liebig on the other hand thinks, that it is the first formed product of all putrefied azotiferous structures. Benzoic acid converts uric acid into hippuric, which is a brownish or yellowish powder, having a cooling, bitter taste; when crystallized it is some-

what diamond shaped, insoluble in alcohol and ether, but can readily be dissolved by diluted nitric acid and solution of potash. It is somewhat volatile, and when sublimed, has a whitish appearance. It can at all times be oxidized with the aid of nitric acid, peroxide of lead and permanganate of potash. If liquor potassæ be added to it, ammonia is disengaged. Dr. Austen states that if lithic acid is subjected to repeated distillations, ammonia, nitrogen, and hydrocyanic acid will be formed.

Salts.—One fourth of the solid ingredients in the urine are saline in their nature. The *sulphates* exist in it in the largest quantities, being chiefly those of potash and soda. *Phosphates*,—though these salts are more numerous than the sulphates, still they are not found in greater proportions. They are introduced into the blood, not only by vegetable, but also by animal diet. The decomposition of the albuminous tissues, particularly the brain, furnish the urine with large supplies of phosphoric acid. There is an augmentation in the system, of the earthy phosphatic compounds after a full meal, and a diminution of them occurs from starvation. The alkaline phosphates are lessened after a good meal of vegetable substances, and become considerably increased from the free use of animal diet. Exercise, both mental and bodily, have also a peculiar tendency to increase the alkaline phosphates.

Chlorides, exist largely in food, and in most of the animal fluids.

Sulphur is occasionally found in the urine uncombined with oxygen.

Fluates of potash and silica are not constant ingredients.

Mucus.—This is the secretion of the mucous lining of the urinary apparatus. When urine is cooled, flakes of mucus will sometimes be found in it, which soon become deposited as a nebulous and opaque precipitate. If the mucus and urea of the urinary secretion are brought into contact with each other, instantaneous decomposition takes place, and the formation of carbonate of ammonia results.

Animal Extractive Matter.—Liebig having analyzed this matter, thinks that it consists of two principles, which he has named *kreatinine* and *kreatine*, both derived from the decomposition of the muscular structures.

The urine in disease.—Under all probability, no subject in pathology, has excited so much attention and interest as the one under consideration. The various diseases common to the urinary secretion, have been extensively and rigidly investigated by several eminent men; this has been sufficiently evidenced by the admirable and elaborate essays, which have been published from time to time, in different parts of the world.

The urine is liable under different states of the system, to become affected either *quantitatively* or *qualitatively*. As there is a certain amount of the serous portion, of the great "*vital fluid*," appropriated for daily elimination from the body, the kidneys and the skin are the principal emunctories deputed to effect such an office; should the ex cretion of one sustain a diminution in quantity, the function of the other becomes relatively increased so that slight alterations in the natural proportion of the urine, may be considered as compatible with health, and afford no data to pronounce the system as being in a diseased condition.

When the urine becomes so materially lessened or increased in quantity, as to attract the attention of a patient, and to be accompanied with symptoms indicative of constitutional disorder, there can be no hesitation in considering its condition as abnormal. There is perhaps no state of the system in which urine is more plentifully secreted than in *diabetes*, and in none so scantily, as in Bright's disease.

Odour.—Occasionally undergoes an alteration in physical properties by disease; as when it becomes a *mellifluous* in *diabetes*, and *ammoniacal* in certain injuries implicating the *great nervous centres*.

Colour.—In some abnormal conditions the natural hue is converted into variegated tints, sometimes greenish yellow when the urine is mixed with bilious matters, deep yellow when the cystic oxide calculus is developed, nebulous when containing chalky, albuminous, chyliferous and mucus deposits, high-coloured, when there is an augmentation of the urea, and pale, when there is a diminution of that nitrogenous principle.

Taste.—In some unhealthy states of the system, the urine possesses either an acid or alkaline taste, according as one or the other of those properties predominates. It is somewhat sweetish in *diabetes mellitus*; the acidity of this secretion is found to be considerably increased in *nervous fevers* and *sea scurvy*.

Density.—The specific gravity of urine in disease generally varies from 1·001 to 1·055. It is the amount of the solid constituents that induces a change in the density of this fluid; when the aqueous portion becomes lessened, and the solid ingredients are actually or relatively increased, the specific gravity of the urine is found to be proportionately heightened. A greater density than 1·030 generally indicates the existence of *diabetes*.

In all abnormal conditions of the urine, the natural constituents may be in excessive proportions, or be partially diminished, and in a few rare cases some may be altogether wanting. The urine may also contain

certain extraneous substances, such as sugar, albumen, chyle, blood, bile, and pus.

Urea.—When this azotiferous principle exists in superfluous quantities in the urine, imminent danger is always to be apprehended. High-color and increased specific gravity of the urine, generally indicate the existence of urea in excess, and this state usnally accompanies the phosphatic *diathesis*.

The best method for all practical purposes of detecting the presence of urea, is to evaporate a few drops of urine on a piece of glass, and by adding to it a little oxalic or nitric acid, crystals of the oxalate or nitrate of urea will be formed.

Lithic acid.—This was first discovered by Scheele, in the analysis of human urinary calculi. In certain diseased conditions, and particularly in that which constitutes the *lithic diathesis*, the urine acquires a peculiar disposition to the development of this acid in excess.

In certain inflammatory affections, such as gout, rheumatism and hepatitis, there is usually a large quantity of this acid in the urine. When free phosphoric, carbonic, and sulphuric acids exist singly, or collectively in the urine, and if lithic acid be in excess it is generally deposited. The circulation of free uric acid in the blood, renders the system prone to inflammations of an erysipelatous and phlegmonous character.

Lithic acid deposits are generally of a brick dust colour, and are chiefly found in combination with ammonia; the crystallized "*red gravel*" is one of the purest forms of lithic acid. Urine yielding this acid in unnatural quantities, is usually high colored and of normal specific gravity. This acid is occasionally voided with the urine as *gravel*. It is sometimes found mixed with colouring matters, having either a light yellow, or deep orange tint. Its separation from the urine is easily effected by the addition of a drachm of muriatic acid to about two or three ounces of urine, the mixture being allowed to stand for a day or two in a covered vessel to prevent the access of atmospheric air; the uric acid will then be deposited in the shape of crystals.

Phosphates.—There is occasionally a disposition in the constitutions of some individuals to the deposition of the earthy phosphates; this state of the system is commonly recognized by pathologists as the *phosphatic diathesis*. This peculiar habit of body, is always attended with serious constitutional disturbance of the chylopoietic viscera. The urine in this diseased condition is generally pale colored, unnaturally copious, subject to rapid decomposition on exposure, becoming speedily alkaline, and exhaling a very disagreeable and offensive smell. It is frequently present in advanced periods of life, and induces much consti-

tutional debility. Children of a delicate and scrophulous habit are also subject to deposits of this nature, and there is always a much greater tendency to their development in the male sex especially after intense mental exertion. The alkaline and earthy phosphates, are precipitated by the application of heat, and are to be distinguished from albuminous matters by their solubility in nitric acid.

CHARACTER OF THE URINE IN CERTAIN DISEASES.

DISEASES.	CONDITION OF THE URINE.
Inflammatory fever... ...	Scanty, high colored, and deposits a red sediment consisting of lithate of ammonia.
Nervous fever...	At the commencement, pale and watery, and as the disease advances it becomes scanty, high colored and fetid.
Putrid fever...	At first pale, subsequently somewhat high colored and very offensive. At the termination of the disease as death approaches, a black sediment is deposited.
Common continued fever....	Scanty and high coloured.
Intermittent fever.....	*Cold stage.*- Scanty, pale, and limpid. *Hot stage.*—High colored. *Sweating stage.* Contains a brick dust colored sediment, consisting of the lithate of ammonia.
Remittent fever..... ..	Scanty and high colored. Occasionally yellow, being tinged with bilious matters.
Infantile remittent fever.	Scanty and high colored. Sometimes deposits a whitish sediment, probably the phosphatic.
Mixed fever.....	High colored.
Hectic fever.....	High colored, somewhat diminished in quantity and contains a lateritious sediment.
Cholera, and in some forms of puerperal fever	Suppression of the urinary secretion.
Exanthemata generally...	Scanty; in the secondary fever of small pox a sediment is deposited.
Inflammatory affections generally, and some surgical operations.....	Scanty, high colored, with occasional deposits of some of the salts and other ingredients, such as lithic acid in lumbago.
Cachexia and other forms of the same complaint	High colored, scanty and deposits a dark and fetid sediment.
Hysteria.....	Limpid and increased in quantity.
Diseases of the heart and other chest affections..	In nearly all we have a decrease of the urinary secretion, and this substituted by profuse, cold perspiration.
Sea scurvy.....	Acidity increased, the urine is also transparent and high colored.
Diseases of the digestive apparatus...	Dysuria.
Jaundice.....	Yellow, being mixed with bile.
Dropsical affections... ...	Generally scanty, and high colored. In anasarca it is sometimes increased in quantity, of a pale color, and deposits a red sediment.
Nephritis.....	Sometimes suppression. At other times scanty secreton with blood. Occasionally the urineis pale, watery, and either, neutral or alkaline.

The following is a description of those particular Urinary diseases not included in the above list.

Diabetes insipidus.—In this affection we have the secretion of the kidneys unnaturally increased in quantity; occasionally exhibiting no changes in its healthy constituents, while at other times there is an augmentation or diminution of the Urea, with an increase or decrease of its specific gravity, according to circumstances.

Diabetes mellitus.—In this form of Urinary disease, we have not only an increase of the Urine, but also a change in the color and taste from containing a large amount of grape sugar. The Urea and earthy ingredients are also defective in their normal proportion. The fluid is subject to rapid putrefaction, and its density is abnormally augmented, averaging from 1·030 to 1·050. The various phenomena which present themselves in the course of the complaint, indicate serious constitutional derangement. All classes, and ages, and both sexes are more or less susceptible to the injurious tendencies of this singular affection. It is most prevalent among men in the middle and advanced periods of life. Dyspeptic ailments generally precede an attack of Diabetes. The Pathology of this disease is involved in obscurity, and most medical men are still undecided as to the origin of the sugar. Some imagine that it is formed in the lungs, others in the stomach, but the majority believe that it exists in the blood and is separated by the kidneys.

Tests for the sugar.—The presence of sugar in the urine may sometimes be recognized by the taste; but this test cannot always be depended on, and is therefore of very little utility in practice.

The specific gravity, when exceeding 1·035 is almost a ready indication of the existence of sugar.

The occurrence of vinous fermentation, from the introduction of yeast into the urine, is an excellent sign of the presence of sugar.

Trommer's test,—Consists in the addition of a few minims of a solution of sulphate of copper to the suspected fluid in a test tube, by which means the hydrated oxide of copper is precipitated, this becomes redissolved by adding an excess of a solution of potash, converting the color into a purplish blue, if any saccharine matter be present, the application of heat will throw down a yellow-brown powder consisting of the Hydrated suboxide of copper. This is an exceedingly delicate test.

Albuminuria.—First described accurately by Dr. Bright. The urine in this affection is partially suppressed, and death takes place sometimes from the supervention of coma caused by the retention of urea

in the system. In this disease, the urine is occasionally found to contain blood in combination with fat; and there is always present in it large quantities of albumen, producing an alteration in its color. The urea and other solid ingredients are diminished, and the specific gravity is unnaturally low, averaging 1·005.

Tests for albumen.—Heat and nitric acid are considered very good tests, and both coagulate the albumen. Certain objections however have been raised to using them separately, and these are very necessary to be known: 1st. Heat alone will throw down the phophates; but this precipitate will be dissolved readily by nitric acid; 2nd, nitric acid alone will sometimes render the urine turbid from precipitating the lithates; but these will disappear on the application of heat.

"The highly acid liquid obtained by dissolving mercury, in its own weight of nitric acid, constitutes an extremely delicate re-agent for albumen and albuminous compounds. This mercurial solution communicates to albuminous substances an intensely red colour, by which means a very minute proportion of albumen in water may be detected.' *Medical Gazette* 10th August 1849.

There are numerous other tests for albumen, but those already enumerated being sufficient for all practical purposes, I shall therefore omit their consideration.

Chylous urine.—This is a species of dyspepsia, arising probably from the malassimilation of food. There is a superabundance of the urine in this disease, which may or may not undergo any alteration in quality, or diminution in density; the density generally varies from 1·010 and 1·020. The colour of the secretion is milky white. Soon after its removal from the system, it coagulates spontaneously into a white gelatinous looking mass, which subsequently becomes resolved into a clear yellow colored fluid, and a flaky substance is deposited. This is an affection of very rare occurrence; I am aware of two cases which have happened in this country.

Blood.—Is occasionally found in the urine in small defined clots, and it is sometimes tinged by it, rendering the fluid of a bright red colour. It can easily be recognised by a microscopic examination, when the blood globules, can be discovered mixed with small shreds of fibrin. Urine adulterated with blood, becomes of a bright red colour, when treated with a saturated solution of chloride of sodium; but as other colouring matters, will impart to urine a somewhat similar appearance, this latter test cannot be considered a sufficiently conclusive one.

Mucus.—We often find in certain diseased states, mucus blended with the urine, to such an extent as to render it of a ropy consistence;

it is, when in combination with the phosphates, sometimes mistaken for purulent matter the only ready means we have of distinguishing one from the other is, by the aid of heat and nitric acid, which, dissolve the mucus and phosphates and coagulate the pus. The urine is generally alkaline in its reaction and mucus can be coagulated by acetic acid.

Bile,—When in large quantity, imparts to the urine a bitter taste and greenish-yellow color. Is known by being insoluble in water, and by the readiness by which it is dissolved in liquor potassæ. Diluted muriatic and nitric acids impart a beautiful green colour to urine containing bilious matters in its composition.

The existence of *pus* in urine can be determined generally without much difficulty.

The urine containing it has commonly an acid or neutral reaction.

It is usually deposited as a homogenous mass, having a cream colored appearance, which if agitated becomes diffused through the whole fluid. By the addition of liquor potassæ to urine containing purulent matter, we have a dense, translucent and gelatinous mass formed. Pus globules can always be recognized through the miscroscope.

The normal reaction of the urine, under certain morbid states of the system, generally undergoes an alteration, into acid, neutral or alkaline. The natural acidity becomes somewhat increased in the lithic acid diathesis. In those pathological conditions of the constitution where a sufficient amount of ammonia is separated to neutralise the healthy acid qualities of the urine, the fluid is then rendered neutral. When any of the salts of potash or soda are administered as internal medicinal agents in combination with a vegetable acid, a chemical change takes place in the system, and the result is the formation of the carbonate of ammonia, which becomes mixed with the urinary secretion, rendering that fluid alkaline in its reaction.

Calculi.—We are indebted to the celebrated Dr. Wollaston, for his numerous discoveries, relative to the true nature of these important concretions. They have been found in four different parts of the urinary apparatus viz. in the kidney, ureters, bladder and urethra. They vary in size from a hen's egg to that of a sparrow's. There are ten kinds of urinary calculi usually described by authors viz. 1st *uric acid*, 2nd *lithate of ammonia*, 3rd *phosphate of lime*, 4th *ammonio-magnesian*, 5th *triple or fusible*, 6th *oxalate of lime*, 7th *cystic oxide*, 8th *xanthic*, 9th *carbonate of lime*, and 10th *silica*.

1st *Uric acid calculus*, is usually of a brown colour, indurated, and composed of numerous laminæ, having one common central point,

and seldom occurs absolutely pure. By dissolving it in liquor potassæ, and then adding a small proportion of nitric acid, we precipitate a dense crystalline mass.

2nd *Urate of ammonia*, has much the same appearance and characteristic marks as the former, and is also known by the evolution of ammonia, when dissolved in caustic potash.

3rd *Phosphate of lime* called also *bone earth calculus* was described by Dr. Wollaston, as being usually of a pale brown color, having a smooth appearance and a texture apparently laminated. It can, though with much difficulty be fused with the aid of the blowpipe. Is readily dissolved in diluted muriatic acid, from which it can again be precipitated by means of ammonia, as a white noncrystallizable powder.

4th *Ammonio-magnesian phosphate*, has a chalky appearance, indurated, and generally somewhat crystalline in texture. Is seldom remarkable for its purity. Supposed by Fourcroy and Vauquelin, to have its origin from the recent decomposition of urine in the bladder. If heated before the blowpipe, evolves ammonia, is soluble in diluted muriatic, sulphuric, and nitric acids.

5th *The triple phosphate or fusible calculus.*—Is soft and of much the same appearance as chalk. A section of it exhibits a polished surface. —It is nothing more than a combination of the two former.—It is soluble in diluted muriatic and nitric acids.

5th *Oxalate of lime, or mulberry calculus*, has much the same appearance as a mulberry, having a rough and somewhat tuberculated aspect. Is of a reddish brown colour, and occasionally pale brown. Its density and hardness is almost equivalent to ivory. Its oxalic acid becomes dissipated before the blowpipe. Is insoluble in hydrochloric acid, when voided immediately after leaving the kidney. Is often contaminated with other substances, and its colouring matter has been supposed to be derived from effused blood, after renal hœmorrhage.

7th *Cystic oxide calculus*, resembles the magnesian limestone in its general aspect. A section of it presents a greasy lustre. It is usually of a pale brown colour. Cannot be dissolved by alcohol, ether, water or acetic acid. Has its origin in the kidneys, as Dr. Marcet supposes. It is capable of decomposition by the application of heat into carbonate of ammonia. Has no effect on vegetable blues. Soluble both in acids and alkalies, and contains a large proportion of sulphur.

8th *Xanthic oxide*, Called also *urous acid*, or *uric oxide calculus*, from being somewhat analogous in its chemical composition to uric acid. Very seldom found as an ingredient of urinary concretions. It

has received the appellation of xanthic oxide, from the yellow compound left after evaporating it to dryness when dissolved in nitric acid. It can be dissolved by potash, and on the addition of the mineral acid, is reprecipitated as a white powder.

9th *Carbonate of lime*, and 10th *silica*, are very rare ingredients of urinary calculi, and consequently need no description. They have never been known to occur in this country.

The mortality from urinary affections, is by no means small; the young and the aged, the weak and the plethoric, all are more or less susceptible of their deleterious influences and exposed to their fatal effects.

ARTICLE II.—*Intermittent fever.* By Assistant Apothecary G. NORTON.—*Continued from page* 8, No. 1.

Prior to the commencement of a paroxysm of intermittent, the patient is usually warned of its approach by a more or less general feeling of indisposition, want of inclination to exertion, and pain in the joints or extremities. These premonitory symptoms, the aggregate of which is called by some the formative stage, do not continue long before

1. The *cold stage* sets in. The cold stage consists of a sensation of cold which may be general, or at first limited to the hands and feet. If the cold commence from the extreme part of a limb, a thrilling sensation is felt along the course of the main vessels or nerves of the member, passing in the direction of the spine. In the absence of this feeliug, or simultaneously with it, there is frequently experienced a sensation as if ice-cold water were trickling down the back. These nervous sensations which have for their centre the brain and spinal marrow follow each other in quick succession, and in a few minutes the cold fit becomes fully established. A sallow and dejected cast of countenance follow, shrunken features, rigors, chattering of the teeth, a desire to wrap oneself in blankets, or some covering to afford warmth to the body, and to avoid the least exposure of surface to drafts or currents of air, or even to the still atmosphere of the place, which produces very unpleasant feelings. The patient folds himself in such a manner that his knees are bent towards the abdomen, and his arms are clasped on his chest, the attitude most likely to retain warmth. The voice is weak; the respiration hurried; the pulse small; the sensible perspiration is suppressed; the skin feels colder to the sufferer than to others

the coldness however is not at all proportionate to the sensations of the patient, as the temperature of the body seldom falls below the natural standard. The urinary secretion which differs in the different stages of the disease, is in this stage generally copious and limpid. Frequently there is disturbance of the stomach, nausea or vomiting of bilious matters with pain or feeling of weight in the region of the epigastrium.

The duration of the cold stage varies. Sometimes it lasts a few minutes; at others, half an hour or an hour; in rare cases it may be prolonged to four or five hours. Some are said to have died in the cold stage of pernicious intermittents, (*febres algidæ*,) the system not being able to establish reaction, and in some rupture of the spleen has been said to occur. The cold stage is sometimes absent.

To the cold stage succeeds

2. The *hot stage*. In the cold stage we observed that the sensation of cold was transmitted from the circumference to the centre of the body, in the hot stage a contrary effect takes place; the feeling of warmth and reaction generated from within diffuses itself towards the circumference. In consequence of this, the cold stage has been by some termed the stage of *concentration*, and the hot stage that of *expansion*. A loss of balance of function having taken place in the cold tage, the system reacts, and in reacting relieves itself of the oppressing cause: and it is a remarkable fact that the symptoms which constitute the stage of reaction, frequently correspond in degree to the previous state of concentration. At first a gentle heat is felt in the region of the stomach, which extends to the head and extremities. The phenomena of the cold stage gradually disappear. The face formerly pale becomes flushed; the pulse becomes developed and increased in frequency; the respiration free but somewhat quickened; thirst is now felt; mouth dry and clammy; the tongue furred; the breath and skin hot. If the symptoms run high, there is restlessness, and the pain and uneasiness of stomach give way to headach, which is sometimes severe.

The hot stage is followed by

3. The *sweating stage* or stage of *termination*. The perspiration commences about the head, it gradually extends to the chest, back and inner part of the thighs, and soon becomes general. Its amount is various; sometimes it is only a gentle moisture, at others it is so copious as to wet the bed clothes. Its smell is sour and disagreeable. The moment the sweating begins a marked relief follows. There is a mitigation of all the symptoms that constitute the hot stage. The pulse becomes tranquil, the respiration free, the increased heat of surface

subsides, the thirst abates; the pains and other uneasy feelings disappear, and the urine deposits a lateritious sediment.

The continuance of the sweating stage averages from three to four hours.

Such are the phenomena which characterize the three stages of a paroxysm of intermittent fever. Strictly speaking there are but two distinct stages; the stage of concentration (the cold), and the stage of expansion (the hot), the sweating which succeeds the hot stage being but the natural efforts of the system at relief. After the termination of the paroxysm, the patient feels restored, with the exception of a feeling of slight fatigue or debility. A period of apyrexia or intermission now follows, during which the morbid phenomena cease, and the patient considers and feels himself well. Still he must be regarded as laboring under the disease, until the tendency to periodical recurrence has been removed.

The time of the day at which the paroxysms commence in the different types of fever is not always the same. In general they observe the following course

	Periodical recurrence of the paroxysm.	*Period of occurrence of the paroxysm.*	*Duration of the paroxysm.*	*Duration of the cold stage.*
Quotidian.....	every day.	morning.	under 18 hours.	usually short.
Tertian.....	every 2d day.	noon.	„ 12 hours.	intermediate.
Quartan.....	every 3d day.	afternoon.	„ 9 hours.	long.

In malarious countries these stated periods are found to be very irregular.

The duration of intermittent fever is uncertain. In favorable cases it lasts four or five days, in others it continues for months. In general the disease is under control, and by proper treatment admits of being cured.

The sequelæ of intermittents are, enlargement of the spleen or liver, dropsical effusions, debility, indigestion, diarrhœa and dysentery. The following is a brief outline of them.

1. *Enlargement of the spleen.*—In the cold stage there is an influx of the circulating fluids to the internal organs, owing either to a spasm of the capillaries of the extreme parts of the body not permitting free circulation through them, or, what is more probable, and perhaps really the case, the heart becomes enfeebled by the depressing cause, and is in consequence unable to propel the arterial current to the periphery. The repeated occurrence of the paroxysm produces congestion or distention of the vessels of these organs, which lose their tonicity and become weakened: the result is that a serous infiltration takes place by permeation through their coats into their parenchyma. The spleen not being a secreting organ, and consequently having no outlet (duct) whereby to

get rid of this hyperemic condition, becomes the focus for the recession of fluids to the internal organism, and is therefore implicated more than any other organ by this deranged state of the circulation. Happily nature appears to have fitted it in some measure for such a contingency. Its structure consists of a meshes of vessels, lacing and interlacing one another, until they divide into the utmost degree of tenuity, unobservable by the naked eye, these are connected together by cellular substance. It receives blood vessels, considering its size, and compared with other organs, larger than is requisite for its simple nutrition. What it may be asked is the use of all this, since nature is very economical in her means, and forms nothing superfluous? Another singular and remarkable fact is, that to every organ and tissue of the body, however minute, uses have been assigned (I do not take into account here the thymus and thyroid glands and supra-renal capsules, which are supposed to be connected with functions performed during fœtal life), the real use of the spleen however remains unexplained satisfactorily to the present day. The opinion entertained by the ancients that it secreted black bile is entirely abandoned, and other opinions of more recent origin appear to be more or less hypothetical. There is much probability however in the belief that, the spleen serves as a diverticulum for the blood, in sudden internal congestions of the system. Its spongy and soft texture strengthens such a supposition. It must be borne in mind that it is only in cases, where intermittents are of long continuance, or where the paroxysms recur frequently that permanent enlargement of the spleen is found to take place.

Enlargements of the spleen, in connection with ague have of late been investigated by Dr. Smith. The result of his observations on this subject, during an epidemic of intermittent fever, which attacked the 18th M. N. I. in Goomsoor, in 1847-48, is contained in a paper published by the Medical Board, in their Medical Reports for 1850. From it, the following extract is made.

"The spleen, we are told, is an organ of compound structure attached to the sanguiferous and lymphatic systems. This compound structure which is partly cellated, partly parenchymatous, has a two-fold set of functions to perform.

1st. The cellated portion of the organ acts as a reservoir or basin, both in health and disease, into which is diverted any excess of blood present in the portal system.

"2nd. The parenchymatous portion of the spleen has some connexion with the lymphatic system, and exerts some influence upon the preparation of the blood.

"Anatomical investigation, the results of experiment, and the effects of disease concur in establishing the truth of these suppositions.

"Owing to its peculiar and cellated elastic structure, in which latter respect it approximates the erectile tissues, the spleen is peculiarly subject to sudden and considerable enlargement.

"The connexion between the fever (intermittent) and enlargement of the spleen is at first most intimate. Previous to the paroxysm the spleen is healthy, the attack supervenes, the spleen enlarges, the paroxysm subsides, so does the volume of the spleen, the attack of fever is cured, and the spleen is found natural. And this may be obscured after repeated attacks of ague, provided the spleen retains its elasticity, and has not suffered from over-distension during the paroxysm, or from organic alteration of tissue. As the attacks recur however, the gland enlarges more and more, and the subsidence of the fever is not accompanied by the immediate subsidence of the splenic volume; re-attacks of fever increase the size of the viscus still more; the enlargement assumes more of a permanent character, though still a simple congestion or hyperæmia amenable to treatment. It is however more of an independent disease, and its intimate connection with the parent fever has in a great measure ceased. It may enlarge, progress, or subside without reference to the presence or absence of fever, and fever may supervene without perceptibly affecting the volume of the diseased organ. Meantime the visceral disease progresses, and treatment being neglected, the simple hyperæmia amenable to remedial means, becomes more or less associated with hypertrophy, and permanent organic alteration of the gland. A few years more, and the indurated ague cake with its attendant evils of ruined health too numerous to be recapitulated here, sets at defiance the resources of the healing art.

"Enlargements of the spleen such as I have endeavoured to represent, do not appear solely in the weak and feeble subjects of ague, but are also to be met with in constitutions, which are young, vigorous, and seemingly healthy. During the epidemic, this disease, as a complication of ague at least, seemed confined in a great measure to the young and middle-aged, for the old sepoys who were suffering from fever, were rarely observed to have any tendency to splenic enlargement. In this, as in other diseases however, some constitutions appear much more predisposed to enlargements than others; cases occur in which tumidity of the spleen supervenes upon a first or second attack of ague, whilst in others repeated and severe fever may attack the patient, and continue to recur for many years without any such effect following.

"Tumidity of the spleen is a necessary consequence of the state of the circulation. The organ is simply exerting its physiological and conservative powers in the economy, and can scarcely as yet be regarded as in a pathological condition. But this physiologico-pathological state if long continued or often repeated, may lead to pathological changes in the organ; instead of being a temporary reservoir, the spleen may become a more or less permanent receptacle for the blood; the size of the viscus may be permanently increased whilst its elasticity is diminished. This state of hyperæmia affects only the first function of the spleen, and consequently its influence upon the general health is but trifling. Presently however changes take place in the proper parenchyma of the organ, hypertrophy supervenes upon hyperæmia (or splenæmia as it is called,) and then begins the disorder in the second

and more important set of splenic functions, namely those connected with the lymphatic and sanguiferous systems, a disorder which too often in unhealthy districts leads to the most deplorable results."

2. *Enlargement of the Liver.*—This may consist in increase of its volume (hypertrophy), or in simple congestion. Its situation and connection with the other viscera in the abdomen and with the portal circle favor such a change. The liver we know is the largest secreting gland in the body. It has traversing through it the branches of the vena portæ, which convey the venous blood of all the organs contained in the abdominal cavity, excepting that of the kidneys and bladder, and of the uterus in the female. In consequence of this double circulation, it is intimately associated with the stomach, spleen and intestines the hyperemic condition of which is indirectly communicated to it. The affection of the liver in such cases is not always subordinate to that of the spleen; in common with other internal organs it receives an increased influx of blood during the cold stage of intermittents, but its collateral connections overtax its energies, and favor enlargement and congestion. Fortunately it has means to a certain extent of relieving itself of this plethoric condition, by the outlet afforded by its duct. In such a state, its natural secretion (the bile) is increased in quantity or altered in quality, or sometimes both. In the former condition diarrhœa supervenes (hepatirrhœa); in the latter dysentery; these two complaints frequently follow intermittent fevers. Sometimes the biliary secretion though increased in quantity or altered in quality, is obstructed in its passage through the hepatic duct, the bile enters the circulation and seeks an outlet through the common emunctories (the kidneys,) and passing off with the urine gives rise to the disease termed *jaundice.* A case of this kind came under my notice in April last.

3. *Dropsical effusions.* Repeated paroxysms of intermittent fever by impairing the functions of digestion and nutrition induce general debility of the system; the result is that serous infiltration into the subcutaneous cellular tissue takes place, giving rise to anasarcous swellings. This form of dropsy is manageable when occurring in young people, and when uncomplicated with dysentery. Another kind of hydropical disease of a more serious nnture sometimes takes place, dependent upon mechanical obstructions to the circulation of blood through the enlarged spleen and liver. It commences by tumefaction of the abdomen, the parieties of which become tense and have a glistening appearance: fluctuation is distinctly perceptible. This variety of symptomatic dropsy (Ascites) follows intermittents in persons generally above the middle period of life, and often terminates fatally.

Two very marked cases came under my notice in the Island of Koolongsoo (in China.) One, a native officer, in whom the disease progressed very gradually, died on ship board returning to India. He came to me early one morning, and requested that he might be tapped, stating that it was with reluctance he had made up his mind to submit to the operation, that there was no help for it, that the dyspnœa had become so distressing, that the risk to him appeared equal in both cases, and that he would take his chance by undergoing an operation. I strove to quiet his fears. *Paracentesis abdominis* was performed at about 8 A. M., and 12 or 15 quarts of viscid glairy fluid were withdrawn ; fainting and syncope followed, and at 2 P. M. he died. He was about 40 years of age. No dissection of the body was permitted. His spleen and liver were both evidently enlarged.

Another case, a young man about 22 years of age, was transferred to the hospital to which I was attached for the purpose of undergoing treatment previous to his being sent to India for the benefit of his health. He had been attacked with repeated paroxysms of intermittent fever. His countenance was lurid, abdomen tumid (like a female advanced in pregnancy,) he had general œdema of the extremities and was emaciated. He was treated with nutritious diet, a loaf and chicken daily in addition to his ordinary rations ; a glass of brandy and water at dinner, a hydragogue purgative (P. Jalapæ C. ʒ i) every third morning, and draughts twice daily during the interval, consisting of from 5 to 10 minims of tincture of digitalis, with camphor mixture and infusion of gentian, one ounce of each. I had the pleasure of seeing him perfectly restored to health, within a month.

4. *Debility* as a sequence of fever needs little explanation. It is a remarkable fact that no disease debilitates the system in so short a time as fever, this however is of little consequence, for as soon as the morbid phenomena cease to occur, the constitution soon recovers its tone and vigor under favorable circumstances; that is to say, if the digestive organs are not materially impaired, and if no visceral obstructions or complications remain behind. In some cases where the functions of digestion and nutrition are affected, the patient continues to be long afflicted with—

5. *Indigestion*,—a most distressing complaint, as I have witnessed in the cases of several (Apothecaries) who served in the Goomsoor campaign. In conversation with some of them, I was informed that they were obliged to be very attentive to their diet. In one, a tumbler of beer disagreed and produced feverish symptoms ; in others, a glass of wine or brandy ; even the eating of a little pork disordered their stomachs. These appeared to me at first mere caprices, but more

intimate acquaintance with a few of them led me to believe that there was some truth in their statements.

6. *Diarrhœa* as a sequela of intermittent fevers is almost always dependent upon debility of the system. If the opinion of Broussais and his followers be correct that all fevers are cases of gastro-enteritis, differing only in various degrees of intensity, we may be disposed to admit that diarrhœa is occasioned by an excited or inflammatory action of the mucous follicles of the gastro-enteric membrane. But the diarrhœa that usually succeeds intermitients is more of a passive character, owing less to an acrimony of the mucus secretion from the bowels, than to want of tone of the muscular coat of the intestines, allowing the ingested mass to pass more speedily through the intestinal canal than is consistent with health. In consequence there is not sufficient time allowed for all the nutritive parts of the food to be taken into the system. The evacuations in such cases are feculent, copious and semifluid. Wine, tonics, a light nutritious diet (not too much in quantity,) exercise in the open air, attention to clothing, flannel next the skin in Europeans, and a flannel band round the abdomen, soon restore the powers and *energies* of the system, and remove this sequela of the disease. If the above state of things continue unchecked, from constitutional idiosyncrasy, a time will probably come when the symptoms will assume a more serious character ; the secretion from the intestinal surface becomes increased, large influx of fluids takes place, the cutaneous perspiration becomes somewhat checked, the skin dry with a feverish feeling towards night, thirst, tongue pale and reddish, thickened round the edges, its surface fissured, papillæ prominent, evacuations watery and whitish. Several such cases occurred in Europeans of H. M. 39th Regiment, who went on an expedition to the "Bhisley Ghauts," in the Coorg territory on the breaking out of the Moplah insurrection at Mangalore in 1837. I was particularly interested in one of them, who was very anxious to get rid of the complaint, which was very harrassing to him. He asked my advice after he had been laboring under the affection about two months. Medicine was of no avail in his case. Alteratives, mercurials in small doses, tonics, (vegetable and mineral), astringents, ipecacuanha, opiates, enemata, suppositories, doses of castor oil occasionally, frictions to the abdomen both dry and with stimulating liniments, pediluvia, hip-baths, attention to diet and clothing, and every other devisable plan of treatment suited to his case had no effect in restraining the diarrhœa. He gradually lost flesh, had a pale cast of countenance, the eyes lost their brilliancy, and he ultimately succumbed without manifest-

ing any symptoms of an active character in the whole course of the disease. Dissection of the body showed, an enlarged state of the liver without the slightest alteration of its structure; the mucous lining of the bowels was pale and flaccid, the mucous follicles, along with Peyer's and Brunner's glands were enlarged; no sign of inflammation or ulceration was to be seen throughout the whole extent of the intestinal canal. The patient was about 35 years of age, and as far as I could learn, was of temperate and sober habits.

7. *Dysentery*, not infrequently follows intermittent fevers. It may occur subsequent to the debility or diarrhœa which succeeds that disease, or it may immediately supervene upon it. Symptomatic of intermittents, dysentery is more frequently seen in the European than in the native subject. The symptoms in general partake a subacute character. I witnessed it in several Europeans (soldiers of H. M. 39th Regt.), who returned from the Bhisley Ghaut Expedition. The symptoms did not run high. They consisted of slight febrile disturbance, stools frequent, sero-mucous, streaked with blood, mixed occasionally with feculent matter, and frequently bilious; tormina and tenesmus not very urgent; cutaneous transpiration partially checked. Tongue furred, sometimes coated with biliary sordes, tenderness of abdomen on pressure, principally along the course of the colon, and over the caput coli. Pulse frequent, but wanting in that jarry feel which characterizes *acute* attacks of dysentery, in which the concomitant fever at times runs very high. The treatment consisted in the application of leeches to the abdomen, which was afterwards covered with an emollient poultice, hip baths, blue-pill occasionally combined with opium at night, followed by doses of castor oil, ext. of gentian and powdered ipecacuanha 2 grains of each, (or one grain of the latter according to constitutional peculiarities,) in the form of pill three times daily; light farinaceous diet; emollient drinks; flannel next the skin, &c. &c. All the cases above alluded to recovered by this plan of treatment.

The affection may be occasioned by a congested state of the vessels of the colon, or by inflammation or irritation of the mucous follicles of the bowels. A mutual sympathy exists between the skin and alimentary passages, alteration of function in one being frequently accompanied or followed by disorder in the other. Very often consecutive dysentery is complicated with hepatic derangement, upon which in the majority of cases it is dependent, especially in the European constitution; it is caused in these cases by an acrimony of the bile, the disease is then termed *hepatic dysentery*.

There is a form of dysentery that succeeds intermittents when occur-

ing in large armies, encamped on the banks of rivers, or on low marshy grounds, the disease then partakes a specific character, owing to privations, fatigue consequent upon harrassing marches, bad water, exposure to night air, &c. &c., and then proves very fatal; the form of fever which accompanies it is adynamic or typhoid, producing great prostration of the vital powers, and, according to the testimony of some authors of experience, the fever, is contagious. Medicine in the majority of such cases is of little avail—The exciting cause must be removed. The only remedy for such a state of things is, to decamp the army, break it up into several small divisions, and direct them to return by separate routes into a more healthy locality. This is not always practicable—much of course will depend on the nature of the expedition, and the objects had in view in conducting it.

PART SECOND.

Notes of Professor A. BLACKLOCK's Lectures on Medical Jurisprudence, by Senior Student C. GEORGES.

COURTS OF INQUEST.

Supposing you are called to a case of hanging by the neck, or to a case of apparent death by any other violent means; your first duty will be to ascertain if life be really extinct and whether it be possible for you to recuscitate the person. If Medical treatment cannot be of service, or has failed, your next duty will be to enquire into the circumstances and look about the premises, without being too inquisitive. You must then send a notice of the occurrence to the Coroner if there be an officer of the kind in the place or see that some one connected with the deceased lose no time in doing so.

A Coroner (from Corona a Crown) is an Officer appointed by the Company or by the Crown to enquire into all cases of sudden death, or death under suspicious circumstances, whether occasioned by an individual's own act, by unexplained though natural causes, or by the acts of others.

If it be a case requiring to be attended to immediately, the Coroner on being informed of the death will proceed at once to the place where it occurred and will order his Constable or messenger to call in some of the most respectable people in the neighbourhood to constitute a Coroner's Jury or Court of Inquest.

If the case will admit of a little delay, the Coroner usually prefers bringing the Jury together by a Summons or Warrant or Order as it is variously named, requesting them to meet him at a certain time, at a certain place. The following is the usual form of the order for the attendance of witnesses.

Coroner's Inquest at Madras upon the body of Chinatumby.

By virtue of this my Order as Coroner for Madras, you are required to appear before me and the Jury at Bell's Alley at Royapoorum on this 21st day of August 1851, at 3 o'clock to give evidence touching the death of Chinatumby, (*the following is added if a post mortem examination be required*) and make, or assist in making, a post mortem examination of the body (with or without an analysis, as the case may be), and report thereon at the said Inquest.

You are not likely ever to be summoned as a Juryman, as you are like other Medical persons exempted from that Office, but whether a man be summoned to serve on a Coroner's Jury, or as a witness before the Jury, he *must* attend, for if he do not attend he may be fined or imprisoned, unless he can produce a certificate to prove he has been kept away by sickness—for it is the duty of every man to obey the requirements of the Law, and to do his best to further the ends of justice. Even motives of self-interest apart from all other considerations would induce us to be ready on all occasions where we may be called upon to give evidence. When a murder has been perpetrated, it is as much the duty of every person to assist in finding out the murderer, as it is the duty of those connected with the Law to administer justice. If a man were poisoned by his Cook, and you did not take the trouble to find out the poisoner, how can you be sure that this same person may not some day get into your service and do the same to you?

A Coroner is usually properly qualified for his Office by a knowledge of Law and medicine. Formerly he was only required to know the Law, but the preference is now given to men who are not only moderately good Lawyers, but also tolerably well versed in Medical matters.

Mr. Wakley, the editor of the *Lancet*, a weekly journal with which you are all well acquainted, has been Coroner for Middlesex in England, and has, through his Medical attainments, filled the office with great advantage to Society at large, and to the people of that county in particular.

When a Coroner has not received a Medical education he cannot well know when he ought to order a post mortem examination, he cannot well determine how far the accounts he listens to may be true or false; and he may consider the statements he hears of a person's death as perfectly satisfactory, and may consider it unnecessary to proceed further in the investigation of the case, while all the time the body may have been poisoned or suffocated. Suppose a servant poisoned his master without being suspected of the deed. The Jury having assembled with a non-Medical Coroner, the servant would be brought in as a witness, and he would naturally try to conceal his guilt by stating that his master dropped dead in a fit, or that he had vomiting and purging and died of cholera. In a case of the kind, a Medical Coroner would be the most likely person to arrive at a knowledge of

the probable nature of the death, and would be most likely also to insist upon a full Medical investigation of the business.

If Coroners are required to be men of good ability and considerable Medical and legal information, it is no less necessary for the well working of Courts of Inquest, that the Jurymen should if possible be men of some education (the more highly educated the better), and capable of forming correct conclusions from their own unaided observations. Ludicrous mistakes and misconceptions sometimes occur from the general incapacity and ignorance of Jurymen, as they are often of necessity taken at random from the most convenient quarter, and without any reference to their education or position in Society. Many years ago when the old Line of Battle Ship Asia was at anchor off Spithead in England, the old wooden legged cook and his son set off in a small boat to amuse themselves with a sail. The boat was upset close to the ship, and the helpless old cook was drowned. The body was taken on board the Asia, and every endeavour made though ineffectually by the Medical men belonging to it to restore animation. The junior Assistant Surgeon and a few sailors were sent on shore with the body. The circumstances were reported to the Coroner, and he forthwith formed an Inquest from the people gathered on the Beach. The witnesses were examined as to the accident, and the treatment to restore animation, and the Coroner and Jury were so satisfied, that a verdict of accidental death from drowning was almost immediately recorded. The Court was about to be dissolved when all at once one of the Jurymen, a tailor, jumped up and said "I see plainly the whole story is a fabrication—the account about the man being drowned is all false. See here! his throat was cut" and with that he went to the body and tore a piece of adhesive plaster from the front of the neck and displayed, sure enough, a cut that had been made, not to extinguish life, but the common tracheotomy incision made for the purpose of inflating the lungs. This led to intense excitement among the Jury, and much explanation was required from the witnesses before the tailor and others like him, could be brought to understand, that the cut had been a humane and well intentioned proceeding, and that there was no occasion for committing the Assistant Surgeon to prison.

A Court of Inquest means a Court for looking strictly into the circumstances of a death under obscure or suspicious circumstances.

There cannot be a Coroner's Inquest, unless upon a body, or portion of a body. If any crime be committed upon the person, and is not followed by the death of the person, the case must be brought before a police Magistrate, or before the Sheriff, previous to its being laid before a higher Court.

The inquest must always be held in the place or neighbourhood where the body is found. Suppose Madras were divided into two separate jurisdictions A, and B, and we had a Coroner for each. And supposing a body were found dead in division A, after being wounded or poisoned in division B, the Coroner of A would have to hold the inquest, and if he found, that the person or persons, who shot or poisoned the deceased, were in the other district he would collect the evidence and report the circumstances to the Sheriff of B, and the Sheriff would then, take measures for the apprehension of the suspected party.

The Coroner can issue a Warrant for the apprehension of any person, who in his own district, may be suspected of having killed the body on which the Coroner may then be holding an Inquest, as it is very necessary that the suspected person should be before the Court, to hear all that may be said to his prejudice or crimination; but if the offender be in another district the Coroner must apply to the Sheriff, who will deliver him up to the Coroner on being served with a Writ of Habeas Corpus, or in plain words, the Sheriff will allow the Criminal if he has him in Custody to appear before the Coroner's Court, when he receives a proper legal notice showing that the Coroner may have or is entitled to the prisoner's body or appearance.

Coroners are obliged to hold Inquests not only on bodies of persons who have died under suspicious circumstances, but also on the bodies of all who have died in jail or other authorized place of confinement even when there is not the slightest suspicion that there has been anything unusual or unfair in the mode of death, when a prisoner is committed to jail it is with a view to his safe custody and not with any intention of subjecting him to any treatment which may injure his person or endanger his life—and it is therefore wisely provided that a strict enquiry shall be instituted by the Coroner into the circumstances which have occasioned a prisoner's death, so that it may be ascertained whether he has died from ordinary dicease or has been killed or has had his death hastened by bad food or foul air or damp or employment for which he was unsuited.

When the Coroner's Jury is assembled, the Coroner tells the Jury, what he knows of the case; explains the laws relating to such cases, the verdicts which the Jury are likely to have to consider, when coming to a decision, and requests them to choose a foreman from among their number. The most intelligent Jurymen is usually chosen as foreman. His duty is to ascertain the opinions of the Jurymen, and convey their desicion to their Coroner; and any questions which the Jury may wish to ask of the Coroner, or any explanations they may wish him to give on difficult points connected with the finding of their verdict, are usually put through the foreman. Any Juryman may put a question direct to the Coroner, but it is most usual to put them through the foreman, who is thus of great service in preserving quietness and decorum during the proceedings.

After these preliminary matters have been gone through, the Coroner takes the Jury into the room, or to the place where the body is laid out, and tells them to view it, that they may satisfy themselves, so far as they can by a mere inspection as to the cause of death, and be able to discern whether the accounts they shall afterwards hear from witnesses agree with the appearances about the deceased. The Coroner may have already informed them, that it has been reported to him that the deceased dropped down dead without any apparent cause, or was found drowned; but on viewing the body they may at once see a large cut on the head, or a bullet wound through the chest, and they begin therefore to question the truth of the information. A medical man is then called in to examine the body, while the Jury proceed to examine the witnesses to the death or the circumstances of the death. Time is thus afforded for the medical man to examine the body, and draw up a report

on the appearances about it; but if the examination is likely to be tedious, or if the Coroner has to procure the opinion of another medical person, the Court is adjourned for a few days. When the dissection is fairly finished the Coroner may grant an order for the interment of the body, unless it be necessary or possible to keep it for identification.

The Medical man is examined by the Coroner in presence of the Jury, and he usually gives in a written report of the post mortem examination. He is not on oath when questioned before this Jury, though the Coroner cannot refuse to allow him to take an oath if he desire to be sworn. But oath or no oath the witness is supposed to speak the truth; and it may be a bad job for him if he do not; for the case may be brought before a higher Court and he will have to give evidence again, and if he has not been telling the truth to the Court of Inquest he, will be very apt to contradict, and so perjure himself, when he is examined as a witness on the same case before the Court of Justice.

You ought always to take notes when attending any patient whose illness has been occasioned in any way by any attempt upon his life, and careful notes should also be made by you of all the appearances, external and internal, which you may meet with when you are examining the body of a person who has died under unexplained or suspicious circumstances. These notes must be kept for your own private information, and to refresh your memory when you are questioned about the case before a Court of Justice. A fair copy or report must be made out to give to the Coroner, but the original notes should be retained in your own possession. Any Court will allow you to look at the original notes that you may refresh your memory; but if you are obliged to state that the notes are a copy of those you took while attending the case, or making the post mortem examination, you will not be allowed to refer to them. Hospital case books may always be used in Court for this purpose; but a case copied from the books would not be allowed as a reference. The Court objects to any reference being made to copies of notes, as it is supposed to be more than possible that you may have extended them, and put what you *supposed* to have been seen by you, as well as what was actually seen by you. It is a good plan to have your original notes attested, as being the original notes, by the signatures of any one or two respectable persons who may have been present at the time you wrote them.

A Coroner can adjourn a Court of Inquest as often as he pleases or rather as the circumstances of the enquiry may render an adjournment necessary, and he can compel the Jury and witnesses, when once summoned, to come together from time to time, at such periods as he may see fit to appoint until a verdict has been delivered.

In cases of homicidal death by wounding or poisoning, the Court after viewing the body, is usually adjourned for some days to afford the Police officers time to collect witnesses. In some countries as India and Ireland, witnesses seldom come forward of their own accord to give evidence which may lead to the death of a guilty party, as they are afraid they may become marked persons, and may themselves suffer injury from the relations of the Criminal; but in England and Scotland the people are not apt to side with the perpetrator of an

outrage against persons or property, and men there speak the truth fully and fearlessly without any regard to consequences, and are as safe after giving evidence as if they had never been cognizant of the crime. Here however there is often great, almost insuperable difficulty in obtaining Criminal information, and I have known that evidence could not be obtained till the relations of the suspected person were imprisoned, as a temporary measure, and then every one who knew anything of the matter was quite willing to come forward with his story.

Then again, it may be necessary to adjourn a Court of Inquest to gain time for the identification of the body. A person may drop down dead in a public thoroughfare, and it may yet be a difficult matter to ascertain who he has been, or where he came from ; or a body may drift a long way down a river, or be cast up by the sea, to a place where there is no one who has ever seen the individual during life ; and in such cases the Court has to be adjourned for a few days, to afford friends and relations an opportunity of coming forward to identify it, and give information of the manner of death if that be possible. In some continental cities of Europe unclaimed bodies of persons found dead are exposed in a building freely open to the inspection of the public, that every facility may be afforded for their being identified. In Paris, as you will sometimes notice in reading cases in works on Medical Jurisprudence, they are exposed in a building named the Morgue, with a shower of cold water continually falling over them to preserve them from becoming offensive, and their clothes are suspended close to each body, as the dress assists materially in helping people to recognize them. In some English sea-port towns this plan is also adopted, though less perfectly by placing the body behind an iron grating in some public place where people are constantly passing. But in this country no plan of the kind would be of any avail owing to the heat, unless the body were at once injected with arsenic, and therefore it is never attempted. All that can be done is to take down the sex, probable age, stature and general development of the body, and to note any peculiarities, if such are noticeable, about the features, teeth, configuration, presence of peculiar marks of scars from burns or wounds or white leprosy, congenital deformities, superfluities or deficiences, old fractures, curvatures and dislocations, and to preserve the clothes or personal ornaments which may have been found on the body.

We do not find Coroners in every part of the British dominions. In Scotland which is still governed by some of its old peculiar laws, which were in force long before the union with England, there is no Coroner, but we have in his stead an Officer who is called the Procurator Fiscal. He is appointed by the Crown to enquire into all cases of death, under suspicious circumstances. He visits the scene of the occurrence, examines witnesses, employs medical men if necessary, and writes down all the evidence. This is what is called taking a precognition, or in other words obtaining a knowledge of the circumstances of the case before it is laid before higher authority.

There are two Courts of Inquest yet to be brought to your notice which, when compared with a Coroner's Court may be called Minor Courts of Inquest. I mean

THASILDARS COURTS OF INQUEST,

and

MILITARY COURTS OF INQUEST.

According to the circular orders of the Court of Foujdaree Adawlut, the Thasildar is in all cases of murder to proceed to the spot, and examine the body, the place where it is found, and all others circumstances likely to lead to the discovery of the crime.

It is the duty of the Potail of the village on receiving information of the discovery of the body of a person supposed to be murdered, to proceed to the spot with the Curnum (village Registrar) and two or three of the respectable inhabitants in whose presence he shall examine every person able to afford any information regar ling the discovery of the body, appearances when discovered, or regarding the circumstances of the murder.

It is the duty of the Head man of the village to send notice of the occurrence without delay to the Police officer of the district. When there is no Police officer, the notice of the occurrence must be sent to the Thasildar; but I consider it would be well in all cases to acquaint the Thasildar with the facts, as well as the Police officer, provided there would be no loss of time in so doing, as every arm of the law ought to be set in motion on these occasions as speedily as possible.

But when the attendance of the Police officer cannot be procured in time, the Potail shall cause the Curnum to take down in writing the evidence of all persons he shall examine, as well as the appearance of the body, and all other necessary particulars, and to frame a report of the proceedings. The Head of the village shall then attest the report with his signature, and obtain to it the signature of the Curnum, and two or three respectable inhabitants who have taken part in the investigation; and shall forward the report and all the evidence to the Police Officers.

If the Potail shall have reason to suspect any person or persons he shall immediately arrest them, and send them to the Police Officer of the District.

A Thasildar has authority to pursue a suspected person into another district, and can compel Police peons and all other persons to assist in apprehending him. Any of you might be requested to assist the Thasildar in a business of this kind, and you might incur a liability to some punishment if you refused to lend your aid, unless you were really ill or engaged in some military duty. The Thasildar's power exceeds in this respect the power of an English Coroner.

The Thasildar must bring the offender before the Magistrate of the district in which he has been captured, and if the appearance of the captured person agree with the printed or written description of him, the Magistrate will pass him on with a letter to the Magistrate of the district in which the offence was committed.

Thasildars and Potails are required by Law to hold Inquests on all persons who die in the jail belonging to their district, or in any kind of confinement.

Military Courts of Inquest differ considerably in their constitution

from Coroner's Courts. If there is a Brigadier in command of the Cantonment, notice of a death under suspicious circumstances among the non-military residents is first conveyed to the Police Magistrate, by whom it is reported through the Deputy Assistant Adjutant General to the Brigadier, who orders a Court of Inquest to be assembled. If a sudden death, not easily explained, occur among the military, the circumstance is reported to the Commanding Officer in whose Lines it may have happened, and the report is by him sent on to the D. A. Adjutant General. A Military Court of Inquest is formed usually of a Captain as President, and two Lieutenants as Members, with a Lieutenant to act as Interpreter to the Court, and a Medical Officer to afford his opinion as to the cause of death, and to make any medical enquiry or post mortem examination that may be considered necessary. The proceedings are conducted much in the same way as in a Coroner's Court. If the Court after hearing evidence is not satisfied as to the cause of death, the President requests the medical officer to open the body and draw out a report of its appearances. Having examined the body, the medical officer appears again before the Court, and gives any further evidence he may have to communicate. When the proceedings are fairly copied out for transmission to the D. A. Adjutant General, the medical officer signs them with the Members of the Court. A Military Court of Inquest seldom lasts more than two or three days; sometimes not more than an hour, when the case is of easy explanation; but if the case be in any way obscure, or there be any informality in the proceedings of the Court, the obscurities and informalities will most likely be detected when the proceedings are forwarded by the Brigadier to the Deputy Judge Advocate General, and the Court will be ordered to re-assemble again, and again till these higher authorities are satisfied with its proceedings and verdict.

In military cantonments an ordinary Punchayat may be constituted a Court of Inquest by the Officer Commanding. He orders the Thasildar to assemble a Punchayat to enquire into the circumstances of the death of an individual, who has lost his life from poison or injuries. I have seen a Punchayat brought together in a military cantonment in a case of murder, where it was necessary to give a verdict against some person or persons unknown, and where it was therefore evidently best for the interests of Justice to have the Court composed of permanent residents in the place, who would be on the spot to enquire further into the matter at any future time, when more information might be obtainable, and not of military officers who would be far from the scene of the murder, and the Inquest, at no very distant period.

Courts of Inquest, whether civil or military, are obliged to return a verdict or finding of the kind of death that has befallen the person, on whose body they are assembled. A verdict literally means a *true word* or opinion of what has occurred. Verdicts are very various, as varied as the injuries and accidents which call for the assembling of Courts of Inquest. We cannot, therefore, enumerate all the verdicts which Courts of Inquest may deliver; but we may specify a few of those most commonly found by Juries.

"Natural Death" is returned by the Jury when the death is traced to usual or natural cause, as sudden death from cerebral, or

pulmonary apoplexy, or rupture of the heart, or rapid death from Cholera. Sometimes in such cases a verdict is returned which specifies the disease as "Died from Apoplexy," or whatever the disease or its mode of termination may have been.

"DEATH BY THE VISITATION OF GOD" is recorded when no marks of a suspicious nature nor of accidental injury can be discovered on or in the body, and when there is, at the same time, no satisfactory evidence of the real cause of death. Sudden deaths of aged persons in whom there may not be any evidence of organic disease, and deaths at any age from nervous apoplexy.

Death by the visitation of God, is intended to signify that it has been His will and pleasure to remove the individual by a *special* act of His Providence, and not after the ordinary manner in which death is permitted to come upon the generality of mankind. But the wording of this verdict is erroneous in two respects. Visitation is not a good word for the purpose of a verdict, as to the mode of death. Visitation means usually punishment. When we speak of a family having had a visitation we mean that it has been visited by some calamity as deadly sickness or dire misfortune. But we cannot speak of God's interposition in our affairs as a calamity. We may deplore His absence; but we cannot, in propriety repine at any manifestation of his presence. Then again, the expression must be incorrect, in so far as it implies that there is no trace of disease to account for the mode of death. God now produces all the effects or phenomena which we witness in the natural world, not by his own direct interference, but by secondary means, so that we cannot have an effect, such as the death of a man, without there having been some immediate cause of the occurrence, and if our means for observation were perfect enough, and we were sufficiently careful and minute in our examination of bodies we should be almost certain of finding some cause to account for the death of the person. Sometimes the most minute examination will fail to afford us any very precise information as to the cause. A man drops down dead from a fit, as we afterwards find out, of nervous apoplexy, which leaves no trace of disease in the brain, spinal chord or heart; when a post mortem examination is made, only negative information will be obtained by our finding no trace of morbid action. But this negative information becomes of great value, if we find on enquiry that the person immediately before death had his nervous system excited beyond its power of endurance, and we may then safely infer that he died of nervous apoplexy. This is a form of death which seldom happens to any but old people; but as it is occasioned by spasm of the capillaries of the brain from undue excitation, it may occur to any person whose vascular system has become irritable from debility, and unable therefore to sustain any great excitement.

"ACCIDENTAL DEATH" is returned when the individual has lost his life by unintentional violence, as by being run over by a bandy, by falling into a river, by a fall from a horse, or by the dropping of a house-tile on his head. There was a custom in former times in England and it is scarcely completely discontinued yet, connected with this verdict, of which I must inform you, as you might otherwise be embarrassed by meeting references to it in the course of your reading;—an old man is crossing the street or road and the driver of a carriage runs the carriage

over him and kills him. The coachman is brought before the Coroner's Court, and of course tells the Jury that he called out to the old man to keep off and he would not, and that the horses could not be pulled up in time, and so the carriage passed over him. A verdict of accidental death is then given with a *deodand* upon the carriage—that is to say, a small fine, half a rupee to ten rupees, is exacted from the proprietor of the carriage. Deodand means literally given to God ; and it was the old custom to appropriate this fine to the purchase of masses for the soul of the person accidentally killed, or it was given to the family of the deceased, if they were poor, or to some other charitable purpose. But the deodand, when inflicted now, which it almost never is, is inflicted merely to mark more emphatically the opinion of the Jury when carelessness has led to the accident, and is so small as to be of little moment to any charity.

"CULPABLE HOMICIDE" means man killing through blameable carelessness, as when a man is killed by some one firing a gun at him, not knowing that the gun was loaded before he drew the trigger. The law does not allow any one to point a knife or fire-arm at any one, even in jest, as serious accidents often arise from such misdemeanours. This verdict has nearly the same signification as manslaughter, though the latter is usually restricted to deaths which occur without any bad intention, as in fights got up for amusement.

"JUSTIFIABLE HOMICIDE" is applied to cases where a person has been killed while attempting to take the life or property of another. If a man were breaking into your house you might fire at him, and if you killed him the act would be only justifiable homicide ; but, if the man were to turn away, on hearing you approach or challenge, and you were to fire and kill him, the deed would be murder, which might make an awful difference to you were you brought before a Jury.

You may even poison a person in self-defence, and if death ensue it will only be justifiable homicide. You are not allowed to put arsenic or any other poison into a man's soup merely because he is endeavouring to take your life in some secret way. But you may throw snuff or pepper or sulphuric acid in his face if he is atttempting openly to take your life, and you have no better and more customary means of defending yourself.

"WILFUL MURDER" is returned when it appears from the evidence that the person was killed by the deliberate act of another. If the murderer is known, the finding will be a direct verdict against (say) John Thomas, but if the murderer is not known the verdict is "wilful murder by some person or persons unknown."

"OPEN VERDICTS" are given when the Jury cannot determine how the person came by his death. Suppose a body is found in the Cooum River, greatly disfigured by fish bites and putrefaction. The Jury would be obliged to say that they had viewed the male body discovered at a certain point, with certain clothes ornaments or marks on it, on the bank of the river, or in the river, on a particular date, but that they had no evidence before them to show how deceased came by his death. In this way, if any information be obtained at any future period, even years after the Inquest, tending to prove that a murder had been committed about that time on a person having particular clothes or marks, it

might appear, on further inquiry and comparison of the witnesses statements with the report of the Coroner's Inquest, that this may have been the very body in question. With this open verdict, which does not involve any certain opinion or decision, the case can be reopened and resifted from the very beginning, and the new investigation may result in the committal of some one for the murder of the person. Had the Jury given a positive verdict of death by drowning, as they might have done inconsiderately, merely because the body was found in the water, or after being thrown ashore, it would have been difficult, perhaps impossible, to enter into any new examination of the question as to how the person came by his death, as their verdict of death by drowning might be considered to set all question or suspicion at rest for ever.

"FELO DE SE" is returned when any one has committed suicide when he is at an age at which he can be supposed to have ordinary discretion, and is in full possession of their reasoning faculties. Children, though in full possession of his reasoning faculties, sometimes, through want of experience, unwittingly inflict upon themselves injuries which result in their own deaths. Now a child, but for our taking into consideration its age of no discretion or indiscretion, might be supposed to have committed suicide were it to kill itself by drinking scalding water from a kettle, after having been angered by the denial of some little indulgence from the parent. This acknowledged want of discretion, however, or absence of that valuable guide and monitor experience, obliges us to ascribe every injury inflicted by a child upon itself as not from design but accident.

Felo de se means a felon of himself, or rather to or against himself. Felon is another word for offender. The crimes which now lead to inquest and are considered felonies, or felonious crimes, are murder manslaughter and felo de se. Felony in law is not easily defined, because the law is constantly shifting its views as to what it should consider felonies, and what is felony in the year 1851 may not be viewed as a felony in 1852. A few years ago forgery and sheep stealing were said to be felonies but now they are only misdemeanours.

The reason why Suicide by a man in his right mind is called Felo de se is, that a man has no more right to kill himself than he has to kill another, and if a man attempt to take his own life and fail, he can be imprisoned and brought to trial just as if he had endeavoured to kill some one else. Mr. Ballantine, who was at the head of the Thames Police some years ago, bound over a woman to prosecute herself for an attempt on her own life, and I dare say other instances might be quoted. If the Jury at an Inquest on the body of a Suicide find he was in his sound mind when he committed the act, and a verdict of felo de se is recorded, the goods and chattles of the deceased are estreated to the Crown, as a fine or forfeit for the felony he has committed, and he is not buried in consecrated ground. Juries of the present day often return a verdict of temporary insanity when there are no very sufficient grounds to bear them out in their finding, as it prevents the loss of property by estreat, to which the relatives would otherwise be subjected, and does not interfere with the decent interment of the corpse; but in assigning this verdict they give the public to understand that there is, in all probability, insanity in the family of the deceased, and thus, in a manner, cast a blot on the survivors. Every family is averse to believe

there is any hereditary disease among its members, such as Scrofula or Insanity, and resents even the imputation—forgetting, or rather not knowing, that they cannot be held in any way blameable for having such disease among them, where it cannot be traced to their own folly or imprudence. People in general are also averse to associate or intermarry with families in which there is supposed to be a tendency to insanity, so that a family is doubly injured by the suicide of any of its members being ascribed to any deprivation of reason. The best verdict in most cases of suicide is an open verdict as to the state of the suicide's mind immediately before and at the time when the act was committed, for who among us can do more than conjecture whetherthe intellect was in reason or out of reason at so awful a crisis.

These are the principal verdicts at Courts of Inquest. We shall next endeavour to give a general view of the proceedings of Courts of Justice.

PART THIRD.

REMARKS BY THE EDITORS.

We feel highly gratified in being able to inform our friends and well wishers that, the first number of our little periodical has been well received and warmly supported by our Subordinate brethren at the Presidency ; and we trust ere long to be able to say the same of those at the Mofussil, many of whom are probably not as yet aware of the existence of such a periodical

As the chief object of our Journal is to bring before the authorities and the public the doings of the Members of the Subordinate Medical Department, we sincerely hope that our brethren will see the necessity of favoring us with their support in the shape of literary contributions, without which aid we shall not be able to carry out our views ; and it becomes every Member of our branch of the service to contribute, as far as he has time, opportunities and matter, something towards the undertaking.

Our best thanks are due to Government and to the Members of the Medical Board for the liberal support we have received from them. Twenty copies of our Journal have been taken by Government, and the Medical Board have caused the first number to be circulated by the Superintending Surgeons, amongst the Medical Subordinates of the several divisions—they have also kindly granted other favors solicited on behalf of our Journal.

Amongst our original articles will be seen a paper on urine in health and disease, written by one of the Senior Students of the Medical College, and although this essay contains no original matter, yet it is useful and worthy of being published from containing in a condensed form an account of this important secretion under various conditions of the system, as such, it demands the particular attention of our Subordinate brethren. The Medico-Chemical investigation of urine is gaining considerable importance amongst the Medical men of Europe. Many diseased states of the system are now known to be attended with characteristic changes either in the quality or quantity of the normal constituents of the urine, and with certain products not observed in this secretion in health—and as a knowledge of these morbid peculiarities afford additional means of diagnosing disease, the publication of Student Karney's paper will afford those who may wish to study this subject, sufficient information for all practical purposes.

We have much pleasure in publishing, from notes taken by one of the Students, the lectures on Medical Jurisprudence by Professor Blacklock and it is our intention to publish the whole of this gentleman's very interesting lectures on this most useful branch of Medical Science, which, as far as this part of India is concerned, will be something new. These lectures require nothing to be said by us in their favor, they speak for themselves, nevertheless we cannot refrain from remarking that they contain information upon subjects which cannot be found in any work on Medical Jurisprudence as yet published. We recommend Professor Blacklock's lectures to the particular consideration of our professional brethren, many of our non-professional friends will also find them interesting and instructive particularly those discharging Magisterial Offices. These lectures may prove to be a valuable accompaniment to that useful book of reference "Bayne's digest of the Criminal Law of the Madras Presidency."

Mr. Quekett's lectures on Histology, as published in the *London Medical Times*, we consider so interesting and useful that we have been induced to give it a place among our selections, and we intend publishing the whole course with illustrations, as they are received. The microscopic anatomy of the tissues is becoming so familiar a subject in Europe, that every

Medical man is supposed to know something regarding the normal and pathological anatomy of the tissues. The subject is in no way abstruse nor difficult, it only requires a good microscope and with the aid of the lectures now being published a tolerably good knowledge of microscopic anatomy may be acquired in a very short time. Mr. Quekett commences his lectures with the vegetable tissues—the normal appearances of farinaceous articles of diet and how to detect adulterations—after this he proceeds to a description of the animal tissues, secretions, &c. in health and disease. These lecture are on the whole very useful and well worth the attention of every Medical man.

PART FOURTH.

SELECTIONS.

LECTURES ON HISTOLOGY.

DELIVERED AT THE

ROYAL COLLEGE OF SURGEONS, LONDON.

By J. T. QUEKETT, Esq.

Assistant-Conservator of the Hunterian Museum.

Gentlemen,—I am happy in again appearing before you in compliance with the appointment of the Council of this College, to contribute my aid towards the furtherance of the objects of science and the advancement of our noble profession.

The subjects of which I have to treat, although connected with the ultimate elements of organized beings, are nevertheless of the highest importance to anatomy, physiology, and pathology, upon a correct acquaintance with which must mainly depend the successful practice of the healing art.

The natural desire of man to arrive at some knowledge of the structure and mode of formation of the bodies by which he is surrounded, and the increased facilities afforded by that powerful auxiliary the microscope, have not only enabled him to gain some general ideas of the elementary parts both of vegetables and animals, but the results of his inquiries have been so numerous and important as to demand for them a new place in the nomenclature of science under the name of Histology—a term derived from istos, a tissue or web, and logos, a discourse.

Among those who have employed the microscope not only with the greatest assiduity, but the utmost benefit both to science and their

fellow-creatures, have been the members of the medical profession. It would be foreign to my purpose to point out the many advantages of the knowledge of the intimate structure of organized bodies, both in a state of health and disease, as this must be fully shown, not only by the publications of the day but by the increasing demand in all parts of the globe for this kind of instruction.

In order to keep pace with the times, the Council of the Royal College of Surgeons, with their usual liberality and anxiety to further the advancement of the medical and collateral sciences, have not only formed a museum of histological anatomy, but have instituted these annual demonstrations, and still further endeavoured to aid their members and others residing at a distance in this branch of inquiry, by the publication of a descriptive and illustrated catalogue of the preparations in their possession. The first volume, containing a description of 1200 specimens, upwards of one third of which are illustrated, is now published, and the remaining volumes, four in number, will follow at subsequent periods.

However striking at first sight the difference between plants and animals may appear to be, yet, when studied as a whole, they will be found gradually to approach each other in their lowest grades, until they meet at length in one common centre, viz., a simple or individual cell. At this point, all means of distinction between the vegetable and animal organism end, and no feature exists which, in the present state of science, can enable even the most distinguished microscopist to determine to which of the two kingdoms the individual cell belongs, since it possesses characters common to both. To settle this question has been a labour of years, and zoologists, botanists, and chemist have each in their turn endeavoured to lay down some decisive characters by which animals and plants might be distinguished.

In the early days of natural history, the power of spontaneous motion and feeding by a stomach, were the ascribed attributes of the animal; now, however, it is well known that certain of the confervæ possess one of the abovementioned characters, viz., the power of locomotion, while the sponges and some of their congeners are destitute of both these attributes. The chemists considered the presence of nitrogen in animal textures to be sufficiently conclusive, but this element has since been found largely in plants; the only compound unknown in the animal kingdem is *starch*, and this is stated to be universally present in the vegetable. The histologist's aid has, as I have stated, been equally unavailing in solving the difficulty, since an appeal to the highest powers of the microscope has only rendered the problem more complex by the discovery of a *common* element, in place of a *distinctive* character; we find a cell to be the starting point of both: hence the necessity of bringing before your notice the structure and mode of growth of the cells in vegetables, which will be an important guide towards the understanding of those found even in the most highly organized animals.

The most simple plants are those denominated cellular, on account of their consisting either of simple cells or of masses of the same; as examples, we may mention the algæ, fungi, and lichens. In such plants there is no distinction between stem and leaf, and they are perfectly

destitute of all trace of flowers ; among the algæ are many genera to the possession of which both botanist and zoologist, respectively lay claim. In the highly organized plants the structure is more complicated, and their elementary tissues, from the variety of form which they present, have been divided into cells, fibres, and vessels ; but modern investigation has proved that the vessels are merely modified or elongated cells, and that fibre is a deposit upon the internal surface of the cell wall.

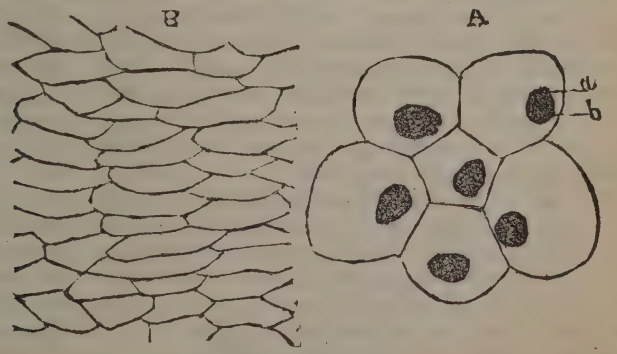
The higher orders of animals exhibit a much greater variety in their external form than those of plants, and their tissues are more numerous, and by far more complex in structure ; but, however much, when perfectly developed, any one animal tissue may appear to have departed from the cellular form, it will, if studied in its embryonic state, be found to have had its origin in cells analogous to those occurring in vegetables.

The first part of the present course will be devoted to the demonstration of the more important vegetable tissues, the second to those of the animal body, and, as far as is practicable, the arrangement adopted in the histological catalogue will be adhered to ; by this plan, two objects will be gained, a text-book will be furnished to assist your studies, and an opportunity afforded you of viewing the principal preparations therein described.

HISTOLOGY OF VEGETABLES.

It is now generally considered by vegetable physiologists that, with the addition of an intercellular mucus or *cambium*, all plants are made up of a membrane existing in the form of cells or utricles, having as an organic basis a tough insoluble material termed *cellulose*. Membrane, therefore, is regarded as the sole elements of plants. Some years since, fibre was also enumerated as an element, but more recent observation has shown that this is always subsequently deposited on the inner surface of membrane.

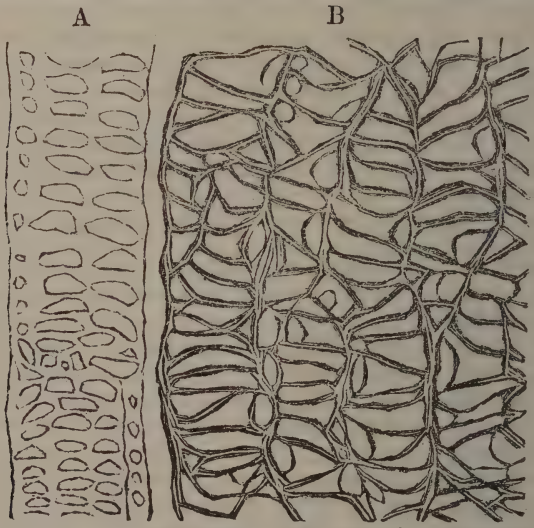
Membrane in its earliest stages is thin, transparent, and structureless, as shown in this specimen of the outer membrane of the seed of a *Gourd, Fig.* 1, B, or in A, which represents cells obtained from the



young flower-stem of a *Leek*. It is generally colourless, or has a greenish white hue ; in some cases however, as in ferns, it is brown.

The beautiful and varied colours of the corollæ of flowers are not dependent upon the membrane composing the cells, but on the colouring matters which, mostly in a fluid state, are contained in their interior; membrane is also, at the stage at which I am describing it, entirely free from visible pores, although fluids readily pass through it by endosmosis and exosmosis; and, notwithstanding many cells and vessels, hereafter to be described, have their walls studded with dots and apparent foramina, yet the membrane is always present, although in some cases it is so excessively thin, that it cannot be demonstrated unless it be charred or stained of a brown colour by the application of tincture of iodine.

Examples are, however, often found in which the cells or vessels are old and dry, and in which the membrane has disappeared, and holes have been left; such is the case in this vessel from a *Balsam*, *Fig.* 2, A,

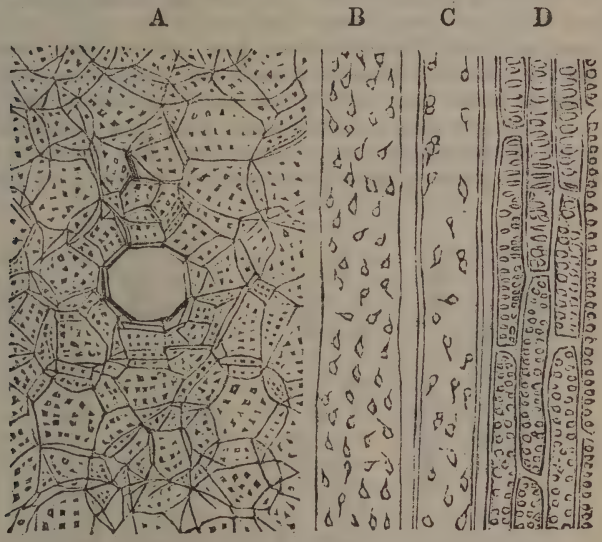


which I submit to your inspection. There is, however, one genus of mosses, that of Sphagnum, in which true foramina are found in newly developed cells; these, which are shown in *Fig.* 2, B, are of a fusiform figure, having a spiral fibre within them, and exhibit a series of holes on either side, which were first described by Mr. W. Valentine, and of their truly perforate nature I have satisfied myself by observing in the young plant, when growing in water, infusoria passing in and out of the cells through these apertures.

In process of growth, the thin membranous cell-walls become thickened by the deposition of new matter either on their external or internal surface, more frequently the latter. The deposit is termed secondary, and, according to Schleiden, mostly assumes a spiral form. It is generally considered, that if the deposit take place before the cell has completed its growth, its form will be that of a spiral fibre or band, in consequence of the cell wall elongated or growing faster than the deposition takes place within; but that, if the deposit supervene upon the complete growth of the cell, it may then so happen that certain parts

may be left uncovered by the deposited material, and pores, or pits having the appearance of pores, are thus produced. We have striking examples of cells containing spiral fibres, or bands, in many plants, especially the Orchidaceæ, as in the *Pleurothallis*, two cells from the leaf of which are shown in *Fig.* 4, E F, and in some elongated cells from the stem of a *Balsam* in *Fig.* 4, B.

The other form of deposition is more common, and is well exhibited in its earliest stage in the two specimens of the root of *Marchantia polymorpha*, in *Fig.* 3, B, C, or in A, which is a representation of the



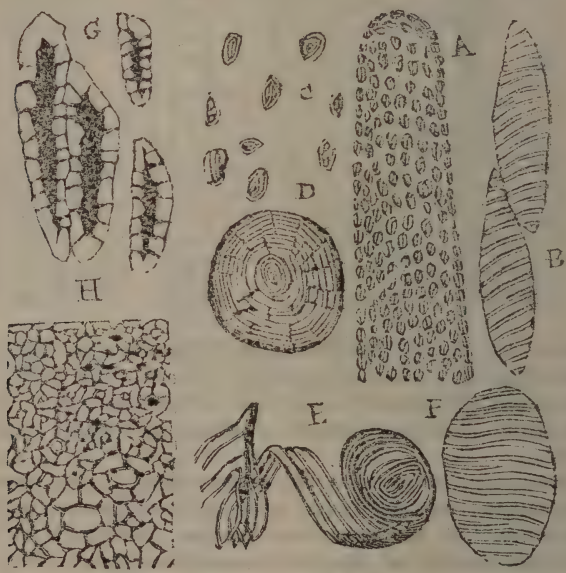
cells forming the pith of the *Elder*; the same fact is strikingly shown in the plant furnishing the Rice paper, or in the *Vine*, as at *Fig.* 3, D; or it may be seen to still greater advantage in the elongated cells known as porous or dotted ducts, examples of which are readily obtained from the *Alder*.

In all these specimens there are no apertures in the membrane or cell-walls; but in the case of some old cells from the stem of a *Balsam*, as shown in *Fig.* 2, A, the membrane has been destroyed, and holes are left. This destruction of the cell membrane is particularly evident, both in the cells and vessels of many specimens of fossil wood, which no doubt before being silicified, had undergone some slight decomposition. There are two preparations described in the Histological Catalogue, H 58-59, in both of which the membrane has been destroyed. In the one a series of oval holes, and in the other only an irregular hexagonal net-work, indicate the original porous type of the vessels.

Membrane may also be thickened by a deposit so dense as nearly to resemble bone, we have examples of this in the stones of the plum, peach, cherry, &c., and more especially in a nut known as vegetable ivory; this hard material has been named *sclerogen* by Turpin; it may occur in a homogeneous form, or in concentric strata, but the deposit is

rarely if ever sufficient to fill the cell entirely, a central cavity, with radiating canals or pores, usually remaining, which, upon section, resembles one of the corpuscles of bone; but in these vegetable sclerous tissues the radiating canals never pass beyond the wall of their proper cells—never anastomose with those of neighbouring cells. The thickening of the walls of cells is well shown in the transverse and vertical sections of one of the scales of the cone of *Pinus Webbiana*, represented in *Fig.* 4, G H, in both of which the pores radiating from the central cavity, and proceeding as far as the cell-wall, are distinctly seen; in *Fig.* 4, D, is shown a large woody cell from the Snake-wood, in which the deposit has taken place in concentric strata.

The specimens now brought before you have all been instances of deposit on the internal surface of membrane; examples, however, are not wanting in which the deposit has taken place on the external surface, but these are rare in comparison with those illustrating the former mode of deposition; in the hairs from the fornix of *Anchusa italica*, a portion of one of these is represented by *Fig.* 4, A; the outer



surface of the thin violet-coloured membrane is studded with oval tubercles, some of which are shown in *Fig.* 4, C; these were first pointed out by Schleiden. In a portion of cuticle taken from an Aloe, the tubercles are so much larger as to give the membrane a rough appearance even to the naked eye.

MEDICINE.

On fatty diseases of the Heart. By Richard Quain, M. D.

The author distinguishes two forms of fatty diseases of the heart, viz.,

one in which there is an hypertrophy of the normally existent fat which encroaches upon the walls of the heart, and sometimes causes, or is coincident with, atrophy of the muscular fibres, and fatty degeneration of the muscular fibre itself. In the first form, which is termed "fatty growth on the heart" the muscular fibre may remain tact; in the second form, "fatty degeneration," sarcous elements disappear, and globules of fat are found within the sarcolemma.

1. *In fatty growth,* the muscular fibres, although they preserve their structure, are in all advanced cases, more or less distorted and convoluted, by the pressure of the masses of fat. The growth of fat commences first in the groove between the auricles and ventricles, and follows subsequently more or less the course of the vessels.

2. The fatty degeneration is most common in the left ventricle, then in the right; then in the auricle, and is least frequent in the left auricle. When present to any amount, it produces changes in the physical appearance of the organ; the colour is pale yellowish brown, or buff, or muddy pink. This buff appearance is seen generally in points or patches, so that the heart has a mottled appearance. The consistence of the heart is also lessened, it becomes flabby, and feels sometimes like a piece of wet chamois leather or wet glove. Under the microscope the cross markings of the fibre are found to have more or less disappeared, and dark highly refractive points of fatty matter are crowded within the sarcolemma, or are distributed linearly along it. If this change occurs in consequence of a local affection of a branch of the coronary artery, it is often extreme; if in consequence of some general systemic condition, it is often less in amount, but more equally diffused. In this last case the whole organ is flabby and soft, but does not appear fatty to the naked eye. The microscope, however, reveals the real state of things.

After this sketch, the author proceeds to allude to previous observations on the same subject; we shall not follow him through this part, but merely remark that he will find the various forms of heart, more extensively known on the continent, in Germany especially, than he has indicated.

The *causes* of "fatty growth" are those which favor obesity generally; advanced age is favorable to it, and according to Dr. Quain, it is four times as common in males as in females.

The causes of "fatty degeneration" are somewhat different. In considering them, the author first advances arguments to show that the fat in the fibre is the product of changes in the fibre itself, and is not a deposit from the blood.

This change in the fibre ensues under two series of conditions: 1, From general or constitutional causes: among 25 cases reported by Dr. Ormerod, 3 had suffered from hœmorrhage, 3 from phthisis, 1 from delirum tremens, 1 from cancer, and 2 from fever. 2, from local modification of nutrition: in 13 of 33 cases of degeneration reported by Dr. Quain, the coronary arteries were more or less ossified or obstructed. In other cases the local modification is a sequence of endo – or pericarditis.

Fatty degeneration is more common in males than females (39 to 16); and in old than young persons, nearly one half of the cases being in persons over 60, and only one case in the series being in a person under 20.

The *effects* of these fatty diseases are next considered. Those of "fatty growth" are thus enumerated; languid and feeble circulation, a sense of uneasiness and oppression in the chest distress in breathing, syncope, angina, coma, sudden death, rupture of the heart. Among 15 cases, 14 died suddenly.

In fatty degeneration, the effects are comprised under the head: (a) Impairment of structure (b) Impairment of function. Under the former head, the author places the frequent increased size of the organ from hypertrophy, and suggests the possibility of the hypertrophy resulting from a natural effort to compensate the loss of power. But in opposition to this it may be doubted whether the sequence is not here reversed, and whether the hypertrophy is not often prior to the degeneration. The texture of the heart, as already said, is softened, and hence frequently ensues the most formidable effect of fatty degeneration, viz. *rupture*. Rupture occurred in 25 of 68 cases, and was complete, that is permitted bleeding into the pericardium, in all but six. From partial rupture also results apoplexy of the heart. Aneurism of the heart also appears to be connected with this condition.

Under the head of impairment of function, the author enumerates the following effects of fatty degeneration: vertigo, syncope, and coma; dyspnœa, either permanent or produced by ascending heights, occured in half the cases; pain in the region of the heart was present in 26 out of 23; in some cases the attacks of pain came on in the manner described by systematic writers under the term angina pectoris, and the author conjectures with much plausibility, that in many cases termed angina the real disease has been fatty degeneration.

The *diagnosis* of fatty degeneration is to be drawn from these symptoms; the pulse also is weak, often irregular, frequently also it is slow. The physical signs are few the impulse is feeble, the first sound feeble; the cardiac dulness, if the heart be enlarged, extensive—there are not necessarily any murmurs. The great practical importance of a knowledge of this condition is shown by the fact, that of 83 cases of fatty degeneration fatty growth, or of "pale flabby heart" (probably from fatty degeneration,)no less than 68 died suddenly.

Dr. Quain is entitled to great praise for the assiduity and success with which he has cultivated this subject. His paper is one of the most valuable contributions to Pathology which has recently fallen under our notice. We trust he will pursue his researches on fatty degeneration of other tissues; he will find ample matter for investigation.

On a case of Albuminous and fatty urine. By Henry Jones, M. D., F. R. S., Physician to St. George's Hospital.

This is part of the account of a case of the so-called "chylous" urine; the chemical details are published in the "Transactions of the Royal Society" and the fatty matter has been specially examined by Dr. Hoffmann. The present paper contains only the history of the case, the microscopical examination of the urine, and the effects of diet and medicine.

The patient, aged 32, born in Trinidad of a Scotch father and colored mother, was by trade a harness maker. He was sober and had led a

steady life. At Christmas, 1848, he observed the urine to be occasionally thick and white, and he suffered at the same time from pains in the loins, and general debility. On the 29th of May, 1849, he was obliged to leave off work. He came under Dr. Jones's care in October, 1849. The urine presented various appearances, according to the circumstances under which it was formed. Sometimes it contained only a few globules of oil; at other times it contained fibrin and coagulated spontaneously, and at the same time gave evidence of albumen, fat, and blood corpuscules. It was then thick and white. Occasionally it remained clear and non-chylous for some hours or days, and then became again thick and coagulated. It was clear for eleven days after giving up work. It was most clear before breakfast, and clearer on a vegetable than an animal diet, but not in any degree. The effect of firm pressure over the region of the loins seemed beneficial to a certain degree, but the effect was not very marked. Matico was decidedly useful; but the medicine which had the greatest effect, and which in fact cured the disease, was gallic acid, which was taken to the extent of a drachm daily, and was continued for fifty-three days.

The following table by Dr. Jones, shows at once the various effects of diet and medicines:

IN 1000 OBSERVATIONS.

	Chylous in different degrees.	*Free from Chyle.*
1 On animal food the proportion is...	968 Times...	32 Times.
2 Vegetable food, ... ,,	..... 910 ,,	... ... 90 ,,
3 Pressure belt loose, ... ,,	..... 667 ,,	... ... 333 ,,
4 Pressure belt tight, ... ,,	..... 628 ,,	.. .. 362 ,,
5 When matico was taken, ,,	..... 474 ,,	... ... 526 ,,
6 When gallic acid was taken ,,	..... 17 ,,	.... 983 ,,
7 After gallic acid, ... ,,	..... 0 ,,	... . 1000 ,,

ON THE PHYSICAL DIAGNOSIS OF DISEASES OF THE ABDOMEN.

By Edward Ballard, M. D.

Late Physician to the St. Pancras Royal General Dispensary, &c.

Introductory Remarks—Regional limits of the Abdomen—Inspection—mode of inspecting the abdomen—results of inspection in health—physical signs derived from inspection in disease.

It will be my endeavour in this and the following papers to present to the reader, in as brief a form as the subject admits of, a systematic account of the physical phenomena presented by the abdomen in health and disease. The earlier papers will be occupied by a general consideration of the results of each mode of physical examination in health, appended to which will be an enumeration of the modifications which disease is capable of introducing: the succeeding communications will contain the special application of physical diagnosis to the most important diseases of this region.

Sight, touch, and hearing, are the senses through which our mind

becomes cognizant of the physical condition of any portion of the body. The modes of examination, then, will resolve themselves, first, into that by *inspection*, assisted by artificial means of rendering its results accurate, the several methods of *measurement*; secondly, that by *palpation*; and, thirdly, that by *auscultation*, assisted by an artificial mode of eliciting sound, *percussion*. We are all familiar with these modes of examination as applied to the chest, but in regard to the abdomen they are not uncommonly either altogether neglected as means of acquiring information touching disease in that region, or used in so slovenly and inaccurate a manner as to lead as often to erroneous as to correct conclusions. But although each method of examination is common to thoracic and abdominal exploration, yet each is not in an equal degree applicable to both. The reason of this is, the different character of the enclosing structures in either region. The organs of the thorax are boxed up within walls which, though not entirely unyielding, are sufficiently so to prevent any handling of the parts within; and the same structure places a limit on the indications which the exterior can give of changes which are wrought in them by disease. The lax and soft tissues, however, of which a great part of the abdominal parietes is made up, yield readily to the pressure of the hand, so that with their mediation it can perceive the size, form, and consistence of many contained parts, and changes in bulk which may chance to occur in these readily become perceptible to the eye by elevation, or falling in of the superjacent wall. Nor can it be said that the thorax has any advantage over the abdomen in the value of the results of percussion, although at present the art of auscultation furnishes the physician with more numerous indications of disease in the former than it has yet been made to supply in the case of the latter region.

Regional limits of the abdomen.—The upward anatomical limit of the abdomen is the arch of the diaphragm; below, it is commonly said to be bounded by the rim of the true pelvis. In disease, however, we are continually reminded of the very artificial nature of this lower boundary line. Organs which in health occupy solely the pelvis, rise in disease above the level of its rim, and take a place among the viscera proper to the abdomen; while, on the other hand, not only are healthy abdominal structures prolonged into the pelvis—as for instance the intestine and peritoneum,—but products of disease gravitate there, and morbid changes, originating in the one, influence the condition of the other cavity, just as if there were really no distinction between them. In fact, when morbid phenomena are under consideration, limitations which the mere anatomist finds it convenient to make must give way to boundaries which nature herself has established, and all must be regarded as abdominal organs, and all that as belonging to the abdomen, whatever its structure and wherever placed, which is covered by its serous membrane, the peritoneum. The strict lower limit of the abdomen, then, is so much of the pelvis and its organs as the peritoneum lines and covers; above, the arch of the diaphragm is the limit, on the upper surface of which lie the lungs and heart, separated from it by the sacs of the pleura and pericardium. The summit of the diaphragmatic arch reaches on the right side the level of the fourth intercostal space; on the left side it only attains that of the fifth rib. On the sur-

face, however, the line which marks the upward limit of the abdomen and the lower limit of the true chest, that which corresponds with the separation of the diaphragm from the thoracic wall, and with the reflection of the serous membranes of the pleuræ or pericardium upon it, passes from the lower extremity of the sternum almost horizontally to the right (at first a little downwards,) "across the conjoined cartilages of the sixth and seventh ribs, then behind the fifth intercostal space," and thence backwards to the junction of the twelfth rib with the vertebra. This line on the left side takes at first a little lower level, but ultimately attains the corresponding point posteriorly. But as, in some diseases of the chest, the lower limit of this region may be depressed below the natural level by the yielding of soft tissues in that direction, so, in some diseases of the abdomen, its upper limit may encroach more or less seriously on the space allotted to the thoracic viscera, by the yielding of the diaphragm and spongy lungs to the pressure from below. In the other direction, increased space is sometimes gained by compression of the bladder, by depression of the uterus towards the outlet of the pelvis, and by a bulging into its canal or towards the vulva of the vaginal wall. Hence it happens that the physical signs of abdominal disease are not confined to those parts which are included in the limits of the healthy abdomen, nor indeed to the truly abdominal organs alone, but must be sought also by examination directed to the chest and its organs, on the one hand, and to the pelvis and its organs on the other.

Inspection.

The information which inspection affords us has relation to *size*, *form*, and *motion*.

Mode of inspecting the abdomen.—In accordance with my former remarks, inspection must take in simultaneously the abdomen and the chest. Both must, of course, be uncovered and exposed in a good light, the subject being protected from cold by a previous regulation of the temperature of the room. This is essential, not only for the benefit of the person examined, but because a sensation of chilliness is incompatible with that perfect rest which it is desirable that the abdominal and thoracic muscles should maintain during the period of inspection. The position of the subject may be either the erect or supine. In disease the latter is often the only available one; but when possible, the erect posture is often to be preferred. Whichever posture is selected, the arms should hang or lie loosely by the side; the subject stand on a level surface, or lie upon an elastic but moderately resistant mattress; the carriage of the head should be unconstrained, or, if lying, it should be supported at the same angle with the trunk as it holds in the erect position. Above all, the physician must not allow the examined to take the place of the examiner; his eyes must be kept directed to some object, either in front of him, or, if he be lying, to the ceiling. An infringement of this rule is often fatal to the accuracy of either inspection or measurement; for, almost involuntarily, some of the muscles will be thrown into activity, or the natural movements be disturbed, when the person directs his attention to them.

Inspection may be made from the front, from behind, and from the sides; sometimes, also, much information is gained in disease by inspect-

ing the patient in several positions,—as standing, or lying upon the back, and upon the sides.

The results of inspection may be referred to two classes—viz., those which relate to the size and form of the exterior, and those which relate to its movements.

Results of Inspection in Health.

1. The general outline of the abdomen is gently convex; but the surface indicates, by various elevations and depressions, the position of the several tissues which constitute its parietes, and, in some cases, of the organs over which they lie. Viewing it from the front, the upper superficial limit of the abdomen, which has been described, is indicated by a depression corresponding with the lower end of the sternum, and passing outwards across the conjoined cartilages of the sixth and seventh ribs, and the fifth intercostal space on either side,—rather lower, as has been said, on the left side than on the right. Tracing the lateral outline of the thorax below this line, it is seen to form a bulging curve downwards, the fullest part being nearer the upper than the lower part of the bulge. This bulging is more marked, for the most part, on the right side than on the left, corresponding, in the former case, with the position of the liver, and, in the latter, with that of the stomach and spleen. The prominence on the left side will vary with the varying states of fulness of the stomach with alimentary or gaseous matters. There is rarely, unless the subject be fat, or the wall infiltrated with serum, any difficulty in perceiving the outline of the lower margin of the framework of the thorax by the change in tension of the wall in passing from this to the part bounded by the laxer substance of the muscles and aponeuroses of the abdomen. Below the margin of the thorax the elevations and depressions of the wall correspond with the position and anatomical peculiarities of its muscular element, and in some degree, also, with the position of subjacent viscera. These markings should be well impressed upon the mind. From the navel downwards to the pubic symphysis the abdomen presents an even convexity, which extends laterally to that part which corresponds with the situation of the lineæ semilunares of the abdominal aponeurosis. Above the navel, however, corresponding with the linea alba, is a shallow depression, best marked at the upper part, and opposite the ensiform cartilage. On each side of this the recti abdominis muscles elevate the surface, but are crossed by transverse shallow depressions, corresponding with their tendinous intersections: the uppermost of these is the least obvious; the lowermost, crossing the muscles just above the navel, is the broadest. External to the recti, and a little internal to the vertical line of the nipples, there is a depression, commencing broad at the margin of the cartilages of the ribs, and running downwards in the direction of the lineæ semilunares, becoming narrower and more shallow below the level of the navel. Exterior to this there is, again, some fulness corresponding with the muscular portion of the broad muscles of the abdomen. The situation of the cristæ ilii, unless in emaciated subjects or in cases of inanition, is marked by a groove, above which the wall bulges out into an elevation of an oval form, which passes downwards and inwards to the linea semilunares, terminating about

the upper part of Poupart's ligament. Viewing the trunk from behind, we see, external to the fulness which marks the commencement of the fleshy mass of the erector spinæ, a shallow depression, corresponding with the extremity of the twelfth rib. The lateral view of the abdomen affords a profile corresponding with the above description of the form of the region. It enables us, however, to form a better idea of the antero-posterior diameter of this part of the trunk, as the anterior or posterior inspection does of its lateral width.

These results of inspection vary, however, with age, sex, habits, the condition of the wall, and the varying state of subjacent organs. *Age*: in youth, in proportion to the nearness to childhood, the size and prominence of the abdomen from the bulk of its contained organs will be greater, while the muscular prominences and depressions will be less strongly marked; the depression marking the upper limit of the abdomen will be lower, and from it downwards the bulge of the lower ribs will be greater, and they and their cartilages will project more externally. *Sex*: in the female a modification arises from the lower degree of the muscular development, and from the greater width of the alæ of the pelvis. The compressing influence of the stays, worn more or less tightly by almost all females, contracts the natural bulge of the lower ribs, and renders them more acute at the angle of the epigastrium, while the lower border of the ribs and their cartilages are forced outwards by the pressure of the displaced organs. This displacement has its influence, also, in modifying the natural depressions of the abdominal wall. *Habits*: in the sedentary the abdomen is fuller in comparison with the chest than in those who undergo active labour; the chest is lengthened as its breadth is diminished, and the angle of the epigastrium is more acute. *Condition of the wall*: fatness and serous infiltration often destroy all traces of the natural markings; the latter, especially, may cause some deception, from its limitation or modification arising from the pressure exercised, and the displacement of the fluid effected by the waistband of the trouser or other articles of dress, as well as by its gravitation to either side, or to whatever may be the depending part. *The varying state of subjacent organs*: this may be exemplified by the instance of the stomach, which, when distended, has its great curvature directed forwards, pressing outwards the costal cartilages and the left lobe of the liver, behind which it lies, and causing that side to be fuller and more prominent than in the empty state of the organ.

2. The expansion of the chest in inspiration is effected not only by the movements of the ribs, but also, and principally, in ordinary breathing, by the descent by contraction and flattening of the diaphragm, which, pushing downwards the underlying organs, causes a protrusion to a corresponding extent of the abdominal walls anteriorly and laterally, which is very evident to the eye. There is also visible a descent of the depression marking the lower limit of the true thorax. In persons whose chests are not covered with much fat we may sometimes see also the spot of the impulse of the apex of the heart in the fifth intercostal space disappearing or becoming faint on an inspiration being taken. In thin persons occasionally a slight movement is visible below the ensiform cartilage, and where, in addition, the curve of the lumbar

region is considerable, occasionally some pulsation also above the navel. The acts of inspiration and expiration are of about equal length.

Physical Signs derived from Inspection in Disease.

1. *Enlargement.*—This may be general or partial; the latter passing under the various terms of *fulness, bulging, elevations,* &c.

A. General abdominal enlargement is often preceded by one of the partial enlargements, of which it appears to be the development and sequel; but in other cases this is not observed, the whole face of the abdominal wall gradually protruding. In extreme cases there is seen a lateral bulge from the cristæ ilii to some point at the side of the thorax, either at or above the seat of the natural transverse depression. The angle of the epigastrium is considerably widened, and the margin of the lower thoracic cartilages more or less everted. In proportion to the youth of the subject, the sternum is thrown forward, and the apex of the ensiform cartilage becomes everted. The age of the patient regulates very much the degree to which the walls of the thorax yield to pressure from below. In the child they readily give way, so that the trunk assumes almost a fusiform shape; in the aged, on the other hand, the ossification of the cartilages opposes this, and the thoracic part of the enlargement is at its minimum. Anteriorly, the enlargement is evenly rounded, sometimes in the erect posture, the upper part being a little more flattened than the rest. Posteriorly, the surface outside the erector spinæ partakes of the general fulness. Even the inferior boundary of the pelvis may yield, and the perinæum present some prominence.

B. Partial enlargement manifests itself in unnatural fulness, bulging, or elevation of any part of the abdominal parietes,—sometimes merely in effacement of a normal depression. The two sides, which are more or less symmetrical in health, may be compared. Partial enlargement arising from disease in the upper or lower part of the abdominal cavity may ultimately terminate in a general enlargement. In these cases the part in which it commences will often exhibit a predominant fulness. The size and form of the enlargement should be noted, since these, together with its seat, will often lead to the recognition of its cause. Changing the posture of the patient will determine whether the distending cause is influenced by gravitation, or whether the part or organ is immoveable. An examination at different times of the day, before and after meals or defecation, will often lead to useful information.

Both general and partial abdominal enlargement may arise from other causes than disease in the abdomen. Empyema, emphysema, or pericardial effusion, may act thus, by depressing the diaphragm, and causing either some general fulness, or merely a local fulness below the margin of the ribs. Extra peritoneal disease of the abdominal wall may also give rise to enlargement. Large depositions of fat beneath the integument, or serous infiltration, together with alterations of form from distortion of the spine, need only ordinary attention to distinguish them from enlargements from abdominal disease.

2. *Depression or retraction.*

A. General depression or retraction, in its minor degrees, affects principally the more yielding portions of the abdominal wall, whose

profile is then concave in place of being convex. Viewed from the front, the abdomen appears to form a basin, its upper rim being the angle of the epigastrium and margins of the ribs, its lower the pubes, Poupart's ligaments and the spines of the ilia—the cristæ ilii project, and the lateral wall of the abdomen is incurved. In its highest degree the natural bulges over the lower ribs are flattened, the margins of the ribs are approximated, and thus the angle of the epigastrium is rendered more acute; and there may, in addition, be visible evidence of the presence of the liver far below the margin of the ribs.

B. Partial depression or retraction may occur wherever an organ either diminishes in bulk from disease, or, if hollow, is reduced to an unusually empty condition, the depression appearing over the seat of the diminished part. Unless the natural form of the abdomen be kept in mind, the error of taking the depressed for the healthy portion, and the natural portion for an enlargement, may be committed, especially when the sides are compared. Retraction of the wall from causes acting merely on the muscles may readily be distinguished from that arising from internal disease.

3. *Altered level of the transverse depression marking the upper limit of the abdomen.*

The upper boundary of the bulges of the lower ribs is raised a little in cases of great abdominal distension, corresponding with the altered level of the liver on the one side, and of the stomach and spleen on the other. In cases where thoracic disease—as emphysema—depresses these organs, it is said that there may be formed in young subjects a new but slight depression marking the new upper boundary. The original depressions may remain more or less obvious, according to the age of the patient.

4. *Altered angle formed by the opposed cartilages of the lower ribs.*

In cases of either general abdominal enlargement, or where the organs occupying the upper part of the cavity are increased in bulk, this angle is increased; and in the opposite condition, of abdominal retraction, it is rendered more acute.

5. *Altered position of the umbilicus.*

In the healthy subject, a line drawn horizontally between the highest points of the two cristæ ilii crosses the umbilicus in the middle line. It is nearer to the public symphisis than to the base of the ensiform cartilage or bottom of the sternum. In some diseases producing enlargement, the height of the navel is manifestly altered, and it is noticed to be either further from the bottom of the sternum than in health, or proportionally nearer to it. This has often indicated to me the seat of the original disease; for, where it has occupied the upper part of the cavity, the distance of the navel from the bottom of the sternum has been greater than the natural proportion, whereas, in cases where disease has originated below, I have seen the natural proportion of its distance between this point and the pubes actually reversed. This is more likely to occur when, by adhesion below the navel, a tumour in this situation causes the wall of the abdomen to rise with it. In cases of general enlargement the wall above the navel has appeared the most disposed to yield in length.

6. *Altered appearance of the umbilicus.*

The natural appearance of this fold does not require description. In disease (*a*) the depth of its *depression may be lessened*, (*b*) there may be greater or less *prominence*, or (*c*) its circumference may be increased and its *surface flattened out* to the general level of the abdominal wall : (*d*) the *depression may be increased.*

7. *Venous enlargements*

occur where return of blood by the large veins of the abdomen is seriously obstructed. In the slighter degrees it is seen only in the abdominal superficial veins descending to the groin ; but, in its highest degrees, as where the vena cava and vena portæ are both obstructed, veins as large as a finger may be seen anastomosing over the whole abdomen, some of them appearing to pass into the cavities of the trunk through the intercostal spaces and axillæ. In these extreme cases the superficial veins of the lower extremities may likewise be distended.

In addition to these signs of disease, there are others arising from abnormal movements as perceived by the eye :—

1. *Defective abdominal respiratory movement.—a* This may be *general*, affecting not only the forward and lateral movement of the abdominal soft wall, but also the expansion of the lower ribs. These movements are sometimes quite inappreciable to the unassisted eye. This arrest of abdominal expansion is constantly accompanied by a proportional increased expansion of the upper ribs. *b.* It may be *partial*, occurring at any portion of the wall. The whole or a part of one side may be thus restrained ; and, as in general defective motion, there is an exaggeration of the movement of the upper ribs, most marked upon the opposite side. Defective movements unnoticed during ordinary breathing become very obvious where an inspiration is forced. The cause of this defective movement may be either the defective or impeded descent of the diaphragm, or a muscular obstacle placed to the expansion of a part or the whole of the soft wall, when motion over a diseased part is productive of pain. This is not a sign peculiar to internal abdominal disease ; besides such painful affections of the wall as rheumatism, inflammatory affections of the serous surfaces above the diaphragm, and paralysis of the muscle, have a similar effect. Exaggerated abdominal movement occurs only as a sign of *thoracic* disease.

2. *Defective descent of the depression marking the boundary* of the chest and abdomen on deep inspiration, is observed where the diaphragm itself is restrained in its descent.

3. *Exaggerated respiratory movement of the sternal ribs** has been already alluded to in connection with defective abdominal movement.

4. *Defective respiratory movement of the sternal ribs* may occur on one side, from pressure made by a diaphragm raised by enlargement of the liver or distension of the stomach. In these cases the corresponding diaphragmatic movements are also restrained.

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* Dr. Sibson has arranged the ribs into three groups :—1st, the *sternal*, from the 1st to the 5th inclusive ; 2dly, the *diaphragmatic*, from the 9th to the 12th inclusive ; and 3dly, the *intermediate*, which are the 6th 7th, and 8th.

5. *Altered rhythm of respiration.*—There is only one disease external to the thorax in which this occurs, and that is peritonitis. Here the expiratory act is shorter than the inspiratory (Sibson).

6. *Altered visible seat of heart's impulse.*—Where, in thin subjects, the diaphragm is raised by pressure from below, the impulse of the heart's apex may occasionally be seen higher than ordinary, and more to the left.

7. *Pulsation* is visible between the navel and ensiform cartilage in cases of extreme abdominal retraction : when occurring only below the ensiform cartilage, it may be due to the action of the heart; below this, pulsation is due to disorder within the abdomen.

8. *Vermicular movement*, or alternating elevation and depression of portions of the soft wall of the abdomen, corresponding with the peristaltic movements of the intestines. This may occasionally be seen where the parietes are thin and relaxed, independently of disease.—*Medical Gazette, July* 18, 1851.

MEDICAL JURISPRUDENCE.

Case of early viability of an Infant.

M. Bierbaum, in an article upon this subject, relates the following case that occurred to his preceptor, Outrepont. A newly married woman bore a child twenty-seven weeks after her last menstruation, and five weeks after perception of fœtal movements, i. e., between 175th and 189th day, it was 13½ inches long, and 1½ lb. in weight ; covered with woolly hair; slept almost uninterruptedly ; seldom opened its eyes, did not cry, but moaned when its position was changed. The pupillary membrane was present, the knees were pressed close against the chest, and the thighs drawn against the belly. In place of nails there were firm white folds of skin. Fifteen weeks after birth it had scarcely grown 1¼ inch, and in its eleventh year was not larger than a child of seven or eight; but in other respects, both mentally and bodily, was as it then should be.—*Med. Zeitung*, 1850, No. 44

On the solidification of foot-prints. By M. Hugonlin.

In cases in which it may be deemed necessary to preserve foot-prints, in a dry state for judicial examination, M. Hugonlin recommends the following procedure: an iron plate supported by bars, is so placed as to be about three or four *centimetres* above the mark to be solidified, and upon it live coals are placed so that heat may radiate to the subjacent soil. When this has become heated to about 100° C., *stearic acid*, reduced to impalpable powder (by previously dissolving it in its weight of alcohol, and then, having added abundance of water, evaporating) is to be dusted over it through a fine hair sieve, so as to form an uniform layer. This falling as a snowy dust, cannot by its weight injure the impression, and is indeed dissolved and absorbed as soon as it touches the soil. It is continued until the earth has become too cold to dissolve any more. After a sufficient time has been allowed for it to have become completly cold, the earth is mined around at some distance so as to raise the entire mass in a single piece, cutting afterwards carefully away the superfluous soil. After reversing it on several folds of

linen, and surrounding it with a case, plaster is allowed to run in between the case and the reverse of the impression, so as to ensure complete solidity to it. If the soil is muddy or marshy, before commencing these operations, a trench should be dug around, into which plaster is to be introduced, which, on solidfying, will absorb much of of the moisture, after which the whole moss may be exposed for some days to the sun and air before commencing to act upon it. M. Hugonlin says this plan is applicable to the most shifting soils, as sand, &c., and indeed to all except snow.—*Annales d'Hygienne* t, 44, p. 429.

MIDWIFERY.

Case of Quintuple birth of living children.— Dr. SERLO of Krossen, relates the following remarkable case. The mother, Æt. 34, had had five favorable labours and was now pregnant for the sixth time. During the last few weeks, she had become so large and cumbersome as to be obliged to keep her bed. Dr. Serlo saw her the day before delivery, and found her abdomen enormously distended in every direction and hard, and projecting much towards the right. The fœtal movements were feeble. She was weak and had a small rapid pulse, with œdema of thighs and legs. On examination the os uteri was found partly open, and the membranes flaccid ; but no part of the child could be felt. As the pains proved very inefficient, Dr. Serlo next day, delivered her by the forceps of a small living child, and soon after of another, which presented by the feet. In like manner others were successively by the feet, the accoucher breaking the bag of waters in each, which presented while he was in search for the placenta. Contraction of the uterus, was produced after some minutes. All the children were alive and crying, but the 2nd died in three hours, the 4th in twelve, the 3rd in in seventeen, the 5th in tweenty-five hours; and the first which had been delivered by the forceps in nine days. The author supplies the weights and admeasurements of the children and the funes ; but we are not aware of the exact relation which those of that part of Germany, bear to our own.

	LENGTH.		WEIGHT.	
	Child.	*Funis.*	*Child.*	*Placenta.*
1st Child	15 Inches.	24 Inches.	3½ civil pounds.	28 ozs.
2nd ,, ...	12½ ,,	11 ,,	2¼ ,,	14 ,,
3rd ,, ...	13 ,,	15 ,,	3⅛ ,,	25 ,,
4th ,, ...	14 ,,	14 ,,	3 ,,	20 ,,
5th ,, ...	14 ,,	11 ,,	3 ,,	20 ,,

MATERIA MEDICA.

Professor Mettaner's Aperient Solution.

Professor METTANER, in an article on constipation, speaks in the highest terms of praise of the following " Aperient Solution :" R. *Aloes Soc*, oz. ii ss ; *Sod. Supercarb.* oz. vi ; *Aquæ* O iv : *Sp. Lavand.* C. oz. ii. After digesting for fourteen days, the clear liquor may be either decanted or allowed to remain. Age improves both the power and taste of the solution. " I claim for myself" the professor says,

"the sole credit of originality in the invention of this compound," a modest claim enough too, which we hope posterity will ratify. The aperient acts both on the liver and the mucoparous glands; corrects and prevents acidity; and probably aids assimilation when oily articles are used as food. It should be given about half an hour after dinner and supper, the common dose being 3 i, though in some cases this may be increased even to oz. i. A single dose is sometimes sufficient and then should be given at bed time, diluting the solution with water if required. It is suitable to almost every example of constipation complicated with defective biliary secretion, except when the state of the stomach is alkalescent; and may be used also in the constipation of pregnancy. It has been found useful in constipation with hœmorrhoidal tumours about the verge of the anus, and especially so in that which accompanies all varieties of perverted menstruation; so much so, that its inventor regards it as a valuable emenagogue wherever constipation is present, while fever and inflammation are absent. In constipation connected with long-continued derangement of the biliary system, or what is sometimes called biliary dyspepsia, it is the most useful of aperients, with which nitro-muriatic acid in doses of a few drops before meals (the aperient being given after meals) may often usefully be associated. It has often been employed with great benefit in the constipation of hysteria and hypochondriasis, a "nervine incitant" as castor or valerian being added to it in such cases. In the constipation of the convalescent stage of fever, when the patients have began to take solid food, it is of great value in preventing relapse, by regulating the functions of the bowels and promoting digestion. It requires in these cases to be cautiously given in small doses. For students of sedentary habits, "it is the very best remedy in the world for obviating the constipation so troublesome, and health-destroying with them at that important and interesting period of their lives. If used regularly, their bowels will seldom or never become constipated, and the use of the remedy is not attended with inconvenience nor trouble, and never interferes in the smallest degree with study or diet" (in spite of the author's somewhat extravagant laudation, we do not doubt this is an extravagant laudation, we do not doubt that is an excellent aperient, and have therefore trascribed the formula).—*Amer. Journal Med. Sc.*, N. S. No. 40, p. 580.

Tannin in Cholera.—Græfe of Berlin prescribed it in upwards of thirty cases, several of which were in the state of collapse, and of these two only proved fatal. The dose was from five to ten grains, half hour or hourly. Dr. Willebrand, of Finland, in reporting the treatment to the Medical Society of Sweden, states that he was himself a witness of this brilliant success.—*Monthly Journal of Medical Science, July* 1851.

PART FIFTH.

MISCELLANIES.

Extract from an interesting book called Physic and Physicians.

(Continued from page 63.)

Asclepiodes, a student from the Alexandrian school, was the next physician of note who appeared at Rome. He commenced as a teacher of rhetoric; but abandoned it for medicine; and, by his eccentric address, in a short time brought himself into notice. The prototype of all succeeding Quacks, he affected to contemn every thing that had been done before him. "*Omnia abdi cavit; totamque medicinam ad causam revocando, conjecturam fecit.*"* He ridiculed Hippocrates, and nicknamed his system "*Thanatou meleete*," "a Meditation on Death." He attempted to explain all the phenomena of health and disease, by the doctrines of atoms and pores. He opposed bleeding, and depended principally upon gestation, friction, wine and the internal and external application of cold water. He first divided disease into chronic and acute, and was the first originator of the *balinea pensilis*, or shower bath; on his principle was established a sect called the methodics. They divided disease into two divisions; first, those which proceeded from structure, and those which were the consequence of relaxation.

The celebrated Themeson, a pupil of Asclepiodes founded this sect. Although Themeson was held in high estimation by some, he was discarded by others, as will appear by the well-known lines of Juvenal:—

> "How many sick in one short autumn fell,
> Let Themeson, their ruthless slayer, tell,"
> Sat 10, v. 221.

It was the custom of the Roman physicians to visit their patients attended by all their pupils, in allusion to which practice we have the epigram of Martial:—

> "I'm ill, I send for Symmachus; he's here
> An hundred pupils following in the rear:
> All feel my pulse, with hands as cold as snow;
> I had no fever then—I have it now."

Among the most distinguished medical writers of the first century, was Aurelius Cornelius Celsus. He has been termed the "Latin Hippocrates." According to good authority, he wrote upon several subjects; in one of his works, now extant, in a passage which deserves to be quoted, as it shows his generous and enlarged mind, he says, "Hippocrates, knowing and skilful as he was, once mistook a fracture of the skull for a natural suture; and was afterwards so ingenuous as to confess his mistake, and to leave it on record."

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* Celsus.

"This" says Celsus "was acting like a truly great man; little geniuses, conscious to themselves that they have nothing to spare, cannot bear the least diminution of their prerogative, nor suffer themselves to depart from any opinion which they have embraced how false and pernicious soever that opinion may be, while the man of real ability is always ready to make a frank acknowledgment of his errors, especially in a profession where it is of importance to posterity to read the truth."

The Medical writings of Celsus are considered only as inferior to those of Hippocrates, over which they possess this advantage, that they have descended to us free from those interpolations and corruptions of the text, which detract so much from the authority and utility of the latter.

Galen flourished 130 years after Celsus, and was Physician to the Emperor Marcus Aurelius. He was considered for many years an infallible authority on all matters relating to Pathology. Galen exhibited from earliest infancy evidence of uncommon sagacity. He detected the futility of prevailing systems. Dissatisfied with what his master taught him, as incontrovertible truths and immutable principles, he was filled as it were, with a new light on studying the writings of Hippocrates, his admiration of which increased on comparing them with the works of nature.

Much has been said of the influence which the study of anatomy had on Galen's mind. After contemplating the structure of the bones of a skeleton, and their adaptation to their different functions, he breaks out into an apostrophe, which has been much admired, and in which he is said to have exceeded any other in pointing out the nature, attributes, and proper worship of the DEITY.

"In explaining these things (he says) I esteem myself as composing a Solemn Hymn to the author of our bodily frame; and in this, I think, there is more true piety than in sacrificing to him hecatombs of oxen, or burnt-offerings of the most costly perfumes; for I first endeavour to know him myself, and afterwards to shew him to others, to inform them how great is his wisdom, his virtue, and his goodness."

The works of Galen, Hippocrates, and Aristotle, were translated into the language of the Arabians to which the science of medicine is not much indebted. They added however, some improvements to the science of botany and materia medica.

Many ages were allowed to roll on before learning was revived in Europe; this was to a great extent effected by the communications which the Crusaders established between the Europeans and Saracens; and at length, the revival of letters in Italy was fully effected in consequence of Constantinople being taken by the Turks. Learning took shelter in the East during the convulsions of the Roman Empire.

Having traced, in this faint outline of the history of medicine, the science down to the revival of letters in Europe, we shall leave it. We never had a very extravagant notion of the value of the ancient Medical writers.* An excessive admiration of them has enabled some to

* Let us learn to distinguish the uses from the abuses of antiquity. Not to know what happened before we were born, is always to remain a child: to know, and blindly to adopt, that knowledge, as an implicit rule of life, is never to be a man.

discover in Hippocrates and Galen, the rudiments, if not the full development, of every discovery which has been made in modern times; while others, falling into the opposite extreme, find the present time, that is to say, the times which they illuminate by their genius, the only times in which any great things have been done towards the advancement of the art which they cultivate.

These opposite modes of thinking, are what Lord Bacon calls, in his own quaint phraseology, "The peccant humours of literature, of which he says, "the chiefest is the extreme affecting of two extremes —the one antiquity the other novelty. Antiquity envieth that there should be new additions, which it may be troublesome to master; and novelty cannot be content to add, but it must deface." "Surely (he says) the advice of the prophet is the true direction in this matter:" *state super vias antiquas et videte quænum sit via recta et bona, et ambulate in ea.*" "Antiquity" he adds "deserveth this reverence, that men should make a stand thereupon, and discover which is the best way; but when the discovery is well taken, then to make progression."*

The mummery of medicine, with all its cabalistic and unintelligible mysticisms, has given place to direct, tangible, demonstrable truths, as simple, as plain, and as interesting as the palpable principles of all other branches of natural philosophy. It is utterly impossible to develope all the nice intricacies of the healing art, or successfully to dispense its numerous blessings, without a strict and perpetual reference to the established operations of nature.

In the beginning, medicine was of necessity a superstitious and an empirical science; that is to say, an experimental art; while nature pursued her course with uniform regularity, and while her operations were uninterrupted by any obstacle, men enjoyed the benefit which it bestowed, without any desire to ascertain their cause and origin; but any deviation from this cause, however trifling it might be, was calculated to excite their curiosity and to astonish their minds. These changes being to them incomprehensible, were readily referred to the agency of some supernatural power; and the infliction of disease was attributed to the wrathful power of an offended deity from whom both the cure and prevention were alone to be obtained. "*Morbus vero adiram Deorum immortalium relatos, et ab iisdem opem posei solitam,*" says Celsus.

This was the true and simple notion of the case and it was abundantly fostered by two principles, which operate powerfully upon all rude nations;—a fond desire to penetrate into futurity, and an eager anxiety to avert impending evils. With regard to the first, it has been well observed by an able writer,† that the human mind is most apt to feel and to manifest this vain curiosity, when its own powers are most feeble and uninformed. Astonished with occurrences of which it cannot comprehend the cause, it naturally associates such occurrences with a mysterious and marvellous influence. Ashamed of events

* "Advancement of Learning."

† Robertson's History of America, Vol. I p. 389.

which it can neither discern the issue, nor anticipate the consequences, it has recourse to other means of discovering them, than that which might be afforded by its own sagacity. Whenever superstition is regularly and systematically established, this desire of penetrating into the secrets of futurity is intimately connected with it. Hence arose the mystic divination of Greece, and Rome, as well as that of our own Druids; and this divination speedily assumed the character and form of a religious ceremony. Priests, and the ministers of heaven, pretended to deliver its oracles to men. They were only soothsayers augurs, and magicians, who possesed the sacred and important art of disclosing what was hidden from less hallowed eyes.

As the diseases of men in a savage state, like those of animals, are few, but violent, their impatience under what they suffered, and their solicitude for the recovery of their health, soon inspired them with extraordinary reverence for those who pretended to understand the nature of their maladies, or to preserve them from their sudden and fatal effects. These ignorant pretenders, however, were such utter strangers to the structure of the human frame, that they were equally unacquainted with the causes of disorders, as with their probable termination. Enthusiasm, mingled generally with some portion of the craft, supplied their deficiencies in actual science. They imputed the origin of diseases to supernatural influence; and prescribed, or performed, a variety of mysterious rites, which they declared to be sufficiently powerful to remove them.

Credulity and reverence favoured the deception, so that, among savages, their first Physicians were a species of conjurors or wizards, who boasted of their knowledge of the past, and who predicted the events of the future. Incantations, sorcery, and mummeries, of divers kinds, were the means which they employed to counteract the causes of imaginary malignancy, upon the assumed efficacy of which they predicted with confidence the fate of their deluded patients.

In Adair's History of the American Indians, we find a particular account of their manner of curing the sick; and the author relates a conversation which he had with an old Indian Physician, who told him they had just killed a witch for using pernicious charms.

Henessin, an earlier writer, bears ample testimony to the mystic ceremonies of these American Physicians and jugglers. The Abbé Poyart, in his history says, that when the king of Cacongo happens to fall ill, his Physicians commence their treatment by publishing his indisposition through the kingdom, and then every one is compelled to kill his dunghill cock, and offer it, as a propitiatory sacrifice to the angry deity whose vengeance is supposed to have fallen upon the monarch. Thus we see, as Pliny has observed, "that magic was the offspring of medicine; and after having fortified itself with the help of astrology; borrowed all its splendour and authority from religion.

Religion was, indeed in the early ages, inseparably connected with medicine, and its principles, were intimately attached to it: its founder was deified, and the art itself accounted divine. The one supplied medicine for the soul, the other for the body; and we question very much whether the tangible benefits of medicine were not more highly valued

if not more highly reverenced, than the uncertain and confused advantages which were promised to the virtuous by the designing priests of a confused and mysterious mythology.

Persia abounds with physicians and astrologers, and the Persians are strongly attached to the occult science of the latter. So much is this the case, that a Persian rarely follows the prescription of his medical adviser, without first ascertaining from an astrologer that the constellation is favourable to the proposed remedy. When a man of note dies in Persia, the astrologer ascribes his death to the uncertainty of physic: while the votary of Galen, on the other hand, throws all the blame on the planet-struck sage, imputing to him an ignorance of the proper time for taking the medicine prescribed. Upon this, the astrologer retorts, that the nature of his profession is extremely hard, when compared with that of the physician; since if he commit an error, by making a wrong calculation, "heaven discovers it," whereas, if a physician be guilty of a blunder, "the earth conceals it;" the patient dies, is buried, and is heard of no more.

Medical men have in all ages been held in high estimation, when the understanding of mankind was not clouded by superstition. The ancients deified their celebrated men, and dedicated temples to their honour. Plato the great heathen Philosopher, says, that a good Physician is only second to God himself. The Athenians must have had an elevated notion of the science of medicine, for there was a law among them, that no slave or woman, should study physic.

The inhabitants of Smyrna associated, upon the coins of that city, the names of their celebrated physicians with the effigies of their gods. The Romans in the early period of their history, did not hold the art in very high estimation; but in the time of Julius Cæsar, when Physicians came from Greece, (the country whence the Romans derived all their polite learning and knowledge of the fine arts,) they were complimented with the freedom of the "Eternal City;" a privilege of which that proud people was extremely jealous. Their great orator, Cicero says, that nothing brings men nearer the gods, than by giving health to their fellow-creatures."

"How the tender springs of life," says an eminent Physician, "that elevate a man to move but a little below angels, vibrate and ravish the mind with pleasure when our art snatches a victim friend from the jaws of death! And shall we then prefer inglorious ease to the divine energy of raising the dead? No, verily: if the soldier who burns, cities and desolates the land by human sacrifices, is worthy of marble or brass, what adequate monument can human art effect for him had burns no cities, but saves their inhabitants, who desolates no country, but peoples it not with stones, as fabled of old, but with his friends, his relations doomed to the grave." The medical man is indeed a guardian angel of a family, a deity of health. If the profession be not a lucrative one, it is a divine one. It is above money, and is "not to be dealt in by attorneyship," as Shakspeare says of love.

It is, indeed, a high gratification to be the humble administrator of relief to our fellow-creatures, but there are drawbacks, to every enjoyment of life. Dr. Cuming in writing to his friend Lettsom, alluding to this subject addresses him in the following strain: "Have you not

sometimes felt the hurried clay-cold grasp of a respected friend's hand? Have you not seen the lack-lustre eye, the wan, perhaps distorted features, and the convulsive pangs of an expiring husband, and father—his bed encircled by an affectionate wife, and a group of weeping infants, whose comfort in the world—nay perhaps whose subsistence—depended upon the life of the parent?—these rend the very heart-strings, and make us deplore the impuissance of our art."

The balance of account betweeu satisfaction and remorse, was jocosely stated by Dr. Warren, to Lady Spencer, who had said, she thought the frequent reflection, that a different treatment, might have saved their patients, must embitter the lives of medical men: he told her, that the balance was greatly in favor of satisfaction, for he hoped to cure her forty times before he killed her once.

It is in the time of such scenes as Dr. Cuming delineates, that when, in the Physician, the friend and the divine are combined, his affection, his good sense, and his sympathy, pour into the afflicted the oil of comfort; he soothes the pangs of woe; he mitigates the distress; he finds out something in the wise dispensations of Providence that he carries home to the bosom of affliction. Hence it is that he is truly a guardian angel, his assiduity makes him appear as a sufferer with the family; they view him as one of themselves—sympathy unites him to them; he acquires new ties, new affections; he mourns with them, and his philosophy points out new sources of consolation—he is beloved—he is become the father of the family—he is every thing that Heaven in kindness deputes, to soften and dissipate misery.

But how often is the medical man, treated with base ingratitude, when his services are not required. How often, is he exposed to the neglect, contempt and contumely of those who are the first, when ill, to demand his services!

God and the Doctor we alike adore,
But only when in danger, not before;
The danger o'er, both are alike requited,
God is forgotten, and the Doctor slighted.

GENERAL ORDERS.

APPOINTMENTS.

G. O. G. 10*th October* 1851.—No. 194—In the Revenue Department under this date, Assistant Surgeon James Crawford, has been appointed to act as Civil Surgeon of Masulipatam, during the employment of Assistant Surgeon H. Stanbrough on other duty, or until further orders on being relieved by Surgeon G. S. Scott.

PROMOTIONS.

G. O. .G 4*th Nov.* 1851— No. 210.—Second Apothecary Henry William King, to be Apothecary, Assistant Apothecary Robert Watson, to be Second

Apothecary, and Acting Assistant Apothecary Thomas Johnson to be Assistant Apothecary from 1st November 1851, to complete the Establishment.

Senior Medical Apprentice Robert Alexander Leonard, to be Acting Assistant Apothecary, from the 1st November 1851, during the absence in Europe on Medical Certificate of Assistant Apothecary J. Atkinson.

G. O. C. C. 1st Nov. 1851.—Junior Medical Apprentice John Ringrow, to be Senior Medical Apprentice from the 24th October 1851, vice G. Henderson, reduced to Junior Medical Apprentice.

G. O. C. C. 4th Nov. 1851.—Paid Candidate John Edwin Ross, to be Junior Medical Apprentice, and Unpaid Candidate William O'Hare, to be paid Candidate.—From the 16th October 1851, vice O'Brien deceased.

Paid Candidate Caleb St. John Lawrance, to be Junior Medical Apprentice from the 24th October 1851, vice T Doyle reduced to Paid Candidate.

G. O. C. C. 12th Nov. 1851.—Junior Medical Apprentice Charles Marrow, to be Senior Medical Apprentice; Paid Candidate Thomas Cripps, to be Junior Medical Apprentice; and Unpaid Candicate Charles D'Santos, to be Paid Candidate—From 1st Nov. 1851, in succession to Johnson promoted.

REMOVALS.

MEDICAL OFFICERS.

G. O. C. C.—4th October 1851.—Assistant Surgeon J. W. Ferminger, from 47th Regt. N. I., to 19th Regt. N. I.

Assistant Surgeon St. G. Williams, M. D., from 19th Regt. N. I. to 47th Regt. N. I.

7th October 1851.—Surgeon G. S. Scott, from 8th Regt. N. I. to 42d Regt. N. I.

Assistant Surgeon J. Wilson, from doing duty 2d Battalion Artillery, to 47th Regt. N. I.

Assistant Surgeon St. G. Williams, M. D., from 47th Regt. N. I. to 8th Regt. N. I.

WARRANT AND NON-COMMISSIONED MEDICAL OFFICERS.

14th October 1851.—Assistant Apothecary J. Rourke, from 2d Light Cavalry to do duty General Hospital.

18h October 1851.—Assistant Apothecary E. Thompson, from 2d European Light Infantry to 1st Battalion Artillery.

Asst. Apothecary D. Gorman, from doing duty 1st Battalion Artillery to 2d European Light Infantry.

Asst. Apothecary C. Perry, from Kimedy to Supg. Surgn.'s Dept. Northern Division.

Asst. Apothecary G. Honor, from Supg. Surgn.'s Dept. Northern Division to Government Dispensary.

Asst. Apothecary R. Wale, from Lying-in-Hospital Madras, to Kimedy.

do J. Gorman, from Government Dispensary to Lying-in-Hospital, Madras.

8th November 1851.—Apothecary R. Thomson, from Supg. Surgn.'s Dept. Saugor Division to Supg. Surgn.'s Dept. Mysore Division.

Apothecary H. W. King, late promotion, Superiutending Surgeon's Department, Saugor Division. To proceed to join at the expiration of his leave.

2d. Apothecary R. Watson, late promotion, Depot of Cuddalore, to remain at Tripasore until relieved.

Assistant Apothecary D. McIntyre, from 4th Battalion Artillery, to Tripasore; Assistant Apothecary H. Phipps, from Supg. Surgeon's Department Southern Division, to 4th Battalion Artillery, and Assistant Apothecary W. Miles, from Govt. Dispensary to Superintending Surgeon's Department Southern Division—To join by the expiration of their respective leave of absence,

Assistant Apothecary G. Drake, from 2nd Regiment N. I., to Government Dispensary. To do duty with the 2nd N. I. until the embarkation of the last Detachment of that Corps when he will join and do duty with the 35th N. I. accompanying the Detachment ordered to embark on the Steamer "Hugh Lindsay" for Madras.

Ag. Assistant Apothecary, R. A. Leonard late promotion to 2d Regt. N. I. —to continue to do duty at the Government Dispensary, till relieved.

Senior Medical Apprentice J. C. Watson; and Junior Medical Apprentice G. Henderson, from doing duty Dispensary 2d District to do duty General Hospital.

G. O. C. C. 24th Nov. 1851.—Assist. Apothy. H. H. Lynsdale, Garrison of Vizagapatam—Under the Commission of the Northern Circars.

Assist. Apothy L. Dyce, 42d Regt. N. I.—Garrison of Vizagapatam.

Junior Medl. Apprentice C. J. Daly doing duty Supg. Surg.'s Dept. Northern Division—Do duty 42d Regt. N. I. to join forthwith.

G. O. C. C. 25th Nov. 1851.—Ag. Apothy. J. North—Doing duty Supg. Surg.'s Dept. Mysore Division—The Medical charge of the Collectors Estt. Bellary to join after his examination at the Presidency.

G. O. C. C. 25th Nov. 2851.—The following posting is ordered to have effect from the 21st Instant

Assistant Surgeon G. Baillie, M. D. from doing duty H. M.'s 84th Regt.—31st Light Infantry.

		From doing duty	*To do duty*	
Senior Medical Apprentice	C. Georges	H. M.'s 51st Lt. Infy.	Lying in Hospital.	To have effect from the 10th Instant.
do	J. Butler	General Hospital		
do	E. A. Etridge	do		
do	C. J. Ambrose	H. M.'s 51st Lt. Infy.		
do	H. Hackett	do	Eye Infirmary.	
do	J. Howard	Native Infirmary		
do	J. W. Lewin	General Hospital		
do	J. Pettigrew	do		
do	D. Karney	Triplicane Dispensary		
Jur. do	C. Marrow	H. M.'s 51st Lt. Infy.		
Sen. do	J. Gray	Eye Infirmary	General Hospital.	
do	P. Anderson	Lying in Hospital	Triplicane Dispensary.	
do	J. Sausman	Eye Infirmary	General Hospital.	
do	C. W. White	do	H. M.'s 51st L. I.	
do	J. Ringrow	do		
do	W. Thomas	do		
do	R. Wilkins	Lying in Hospital	Dispensary 2d District.	
do	C. Smith	do	Native Infirmary.	

G. O. C. C. 3d October 1851.—2d Dresser F. Pareanoyagum, No. 119, from doing duty Sub Collector's Department Coimbatore to Sub Collector's Dept. Coimbatore.

2d Dresser A. Ramasawmy Naidoo, No. 153, from doing duty Dispensary at Coimbatore to do duty Supg. Surgn.'s Dept. Southern Division.

2d Dresser M. Veerasawmy, No. 176, from Supg. Surgn.'s Dept. Southern Division to Dispensary at Coimbatore.

18th October 1851.—2d Dressers Appiah, No. 150, from Civil Dispensary at Mangalore to 34th Light Infantry; Iyaloo, No. 100, from 27th Regt. N. I. to Civil Dispensary at Mangalore; and Chutter Singh, No. 224 from 34th Regt. L. I., to 27th Regt. N. I.—To have effect from date of arrival of the 27th Regt. N. I. at Mangalore.

2d Dresser M. Ummanah, No. 216—Civil Hospl. Masulipatam to 5th Regiment N. I.

2d Dresser A, Seevaram, No. 298—5th Regt. N. I. Civil Hospital Masulipatam.

MISCELLANEOUS.

G. O. C. C. 1st Oct. 1851.—With reference to G. O. C. C. of the 12th ult. Assistant Surgeon W. H. Boutflower, will remain in Medical charge of the Wing of the 4th Regt. N. I. at Hurryhur, on the march of the Head Quarters and a Wing of that Corps, and ultimately proceed with it to Mercara.

15th Oct. 1851.—With reference to G. O. C. C. of the 7th Instant, Assistant Surgeon St. G. Williams, M D. of the 8th Regt. N. I. will proceed to join his Corps in anticipation of the arrival at Ganjam, of Assistant Surgeon Aldred, M. D.

Assistant Surgeon W. Aitken, M. D. of the 18th Regt. N. I. will take temporary charge of the Zillah of Ganjam, until the arrival of Dr. Aldred, without prejudice to his Regimental duties.

18th Oct. 1851.—Assistant Apothecary J. J. Wood, of the 43rd Regiment, N. I. will do duty at the Government Dispensary until the arrival of Assistant Apothecary Honor.

G. O. G. 31st Oct. 1851 No. 206.—The following Extracts from a letter from the Hon'ble the Court of Directors in the Military Department, dated 17th Sept. 1851, No. 51, are published for the information of the Army.

Letter dated 17th September 1851, No. 51.

Para 1. We have permitted the undermentioned officers to return to their duty, viz.

Surgeon James Supple,
,, W. G. Davidson,

2. The undermentioned Officers have been granted extensions of leave for the periods viz.

Assistant Surgeon John Mathison, M. D. } 6 months.
,, ,, C. Daubeny, }

No. 5. of 1851.

List of Rank of an Assistant Surgeon for Madras.

To rank from the date of the sailing from Gravesend of the Ship by which he proceded, viz.

James Edward Dickinson "Vernon," 10th September.

G. O. C. C 1st Nov. 1851.—The leave granted to Assistant Apothecary J. Aitke of the Medical Department, in G. O. C. C. of the 22nd March last is cancelled.

G. O. C. C. 28th Nov. 1851.—Assistant Surgeon G. Baillie, M D. of the 31st Regiment L. I. having been reported fit to return to his duty, the unexpired portion of the leave of absence on Sick Certificate, granted him on G. G. C. C., 27th September 1851, is cancelled from the 21st Instant.

G. O. C. C. 8th Nov. 1851.—2nd Dresser A. Ramasawmy Naidoo No. 153, doing duty Superintending Surgeon's Department Southern Division, is directed to proceed and place himself under the orders of Captain P. M. Francis, of the Engineers, for the purpose of affording Medical Aid to the working party employed in the construction of the Barracks at Jackatallah, Neilgherries.

G. O. C. C. 10th Nov. 1851.—W. Vencatasawmy Naidoo, late 2d Dresser No. 174, is re-entertained as a 2d Dresser on the Establishment from this date, and posted to the Collector's Department at Ganjam, which he will proceed to join.

G. O. C. C. 10th Nov. 1851.—The removal of 2d Dresser P Sasachellum, No. 146, in G. O. C. C. of the 3d Ultimo, is cancelled.

LEAVE OF ABSENCE.

G. O. C. C. 21st Oct. 1851.—Apothecary R. Harper, Supg. Surgn.'s Dept. Nagpore Subsidiary Force, from 27th Oct. 1851 to 26th June 1852 Presidency Centre Division.

24th Oct. 1851.—2nd Apothecary H. W. King, Depot of Cuddalore, from 1st November 1851 to 30th April 1852—Madras and Eastern Coast.

8th Nov. 1851.—Assistant Apothecary R. Wale, attached to the Station of Kimedy, is permitted to remain at Madras until the 10th December 1851. when he will proceed to join his Station.

G. O. C. C. 17th Nov. 1851.—Surgeon A. Goodall, 1st Madras Fusiliers, from 15th Dec. 1851 to 15th March 1852—Neilgherry Hills.

Apothecary H. E. Hall, Pension Establishment, from 15th Nov. 1851 to 15th Nov. 1852—Madras.

G. O. G. 25th Nov. 1851.—No. 222—The undermentioned Officer is permitted to return to Europe.

Surgeon John Charles Fuller, on Medical Certificate—to embark from the Western Coast.

G. O. G. 28th Nov. 1851.—No. 224—Surgeon John Lovell, is permitted to proceed to Bombay on private affairs, with leave of absence from the 25th Jan. to 25th March 1852.

ORDERS OF IMPORT.

G. O. C. C. 4th November 1851.—No. 63—The Commander-in-Chief directs it to be notified, that Government has sanctioned the addition of an Apothecary to the Establishment for the medical charge of the Collector's Establishment at Bellary.

G. O. C. C. 21st Nov. 1851.—No. 68—Under instructions from the Hon'ble the Court of Directors, the Commander-in-Chief directs that Surgeons who may hereafter obtain leave to proceed to Europe, be struck off the Returns of Corps from the date of promulgation of the Order granting the leave.

With reference to the above, all Surgeons now in Europe and borne on the strength of Corps are to be struck off from the date of receipt of this order.

OBITUARY.

With regret we announce the death of Student C. O'Brien, of the Medical College, which took place on the 16th October 1851. The deceased has left a poor widowed mother destitute of any means of support. Small subscriptions on her behalf will be thankfully received by us.

NOTICE TO CORRESPONDENTS.

The note from Tyro is too concise for our purpose. The subject is a good one and with a little care might be rendered, both acceptable and useful to our readers. The papers from Messrs. Wood *and* Bogg, *have been received and will appear in our next.*

PART FIRST.

ARTICLE I.—*Notes on Inflammation.* By Assistant Apothecary ALEXANDER BOGG.

1. *Definition.*—Inflammation is said to consist in an unnatural or perverted condition of, or in the capillary bloodvessels of a part, attended with a change of structure and a tendency to morbid secretion. It is characterized by pain, redness, swelling and heat, and accompanied with more or less of fever. Inflammation occurs in almost all the tissues of the body, and affects different parts very variously; almost all diseases begin with, or end in inflammation, or are accompanied by it during some part of their course.

2. *Theory.*—Various opinions are entertained by Pathologists regarding the precise nature of inflammatory action, some attributing it to a "lentor or viscidity of the blood, others to an error loci, i. e. an obstruction of the capillaries by the entrance of globules too large to pass through them." Some say that the action of the small vessels is increased, others assert that it is diminished, and that the vessels are in a state of atony. Some Experimentalists believe that there is a surcharge merely in the quantity of blood sent to the part, and that it cannot be returned in the same quantity by the veins, and thus attempt to account for the accumulation in the arterial vessels. It is however universally agreed that inflammation is a morbid action of and in the capillary vessels. This portion of the great circulating system appears to act a very important part in the animal œconomy. In health it performs the important part functions of nutrition and secretion, in disease it is the principal seat of those changes which are designated by the terms "inflammation, congestion," &c. Whatever may be the opinions of Pathologists of the proximate cause of inflammation, it is sufficient forall practical purposes to know that in the capillaries of every acutely inflamed part, the blood is circulated with preternatural slowness that the whole balance of the circulation is destroyed, the solid particles preponderating over the fluid, and that this vascular excitement may end in one of two or three different ways, viz. by exudation of *serum* or *lymph* through the capillaries into the interstices of the part, or perhaps by rupture of the capillaries, and extravasation of blood, or if the inflammation continue, the tissues become completely broken down and disorganized at

the points where the inflammation is most intense, and *pus* is formed out of the exuded lymph, or if the inflammation increases in severity, the blood ceases to circulate in the vessels, and *mortification* of the tissue ultimately takes place. It is generally admitted, that the bloodvessels, the nerves, and the blood itself are essentially concerned in this process.

3. *Stages.*—It cannot be doubted that the varied and important functions of the extreme vessels are under the immediate and powerful influence of the nervous system, and particularly that part of it which conveys the influence of the emotions. The capillaries, like the arteries, possess a power of contraction and dilatation, which is very much under the influence of this same nervous system. We have familiar illustrations of this fact in the act of *blushing*, which consists in a sudden enlargement of the capillaries, and small vessels of the surface; whilst the converse state of *pallor*, is evidently due to an unusual contraction of the same vessels, and there can be no doubt that *morbid congestions*, which sometimes are separated from those that are consistent with health by slight shades of difference, are often determined through the agency of the same nervous system. These local determinations of blood may proceed from constitutional or local causes, they may be produced also at pleasure upon the surface of the body, and that in various ways, by friction, by the application of gentle stimulants, &c. When a stimulus is applied to a living part, we produce in the first place an impression on the nerves of the part, this being conveyed to the central nervous system and ultimately to the capillary vessels themselves, an unusual contraction of the vessels takes place, the velocity of the blood is accelerated, and a determination of blood towards the part speedily ensues, and a degree of redness appears in the part which soon subsides if the exciting cause be removed in time. This *active determination* of blood when unaccompanied by any other change is distinct from true congestion, and is the first obvious step towards that complex process viz., that of inflammation, and is therefore called the 1*st stage*. It may be remarked that this is an action perfectly compatible with good health, and necessary to many natural phenomena, as for instance the enlargement of the womb during gestation, and the secretion of milk after delivery; when morbid it causes excitement and functional derangement.

2*nd Active Congestion.*—This is a state of disease, and the effect of debility. In this stage of the process of inflammation the following changes take place. If the exciting cause be continued longer, or its intensity increased in a slight degree, it may be observed that a more rapid flow of blood to the part ensues, the blood not being carried off as

quickly as it arrive soon accumulates. The strength and action of the smaller vessels diminish as their distension increases. Various degrees of turgescence, swelling, heat, redness, and pain begin to manifest themselves; the healthy functions of the part, that is to say, secretion and absorption begin to be modified, as the congestion increases, the circulation which was at first accelerated, becomes slow and labored, arising from over distension of the vessels, and increased thickness and viscidity of the blood, the change of the blood from arterial to venous is interrupted, there is yet, however no change of structure in the part, nor formation of new products, the circulation although slow is still only partially interrupted. This is what may be said to constitute the state of the bloodvessels under *active congestion*, which is one step short of inflammation. Active congestion as such, does not continue long, it either passes on to inflammation, or insensibly vanishes, depending upon the severity of the exciting cause; the cause continuing to act the phenomena of true inflammation begin to manifest themselves.

3*rd Actual inflammation.*—This period of the process of inflammation is characterized by the following remarkable alterations, the capillary tubes instead of contracting upon their contents, dilate, or grow larger, and the circulation is *completely* interrupted; the blood coagulates, clogs the vessels, the globules cohering in irregular masses, and *stagnate* in several points of the inflamed part; some of the vessels give way, and blood or fibrine is effused in the parenchyma, serum also exudes, a decided change of structure is produced, and the functions of the part are more or less completely suspended.

4. *Marks of inflammation.* 1*st Redness.*—The redness of inflammation is *preternatural* in degree, for many parts of the body are by nature and in health, more or less red. This phenomenon is manifestly owing to the increased quantity of blood in the inflamed part, so that the smallest capillaries are distended with globules, and rendered visible to the naked eye, there is evidently more blood than usual in those vessels which naturally carry red blood, and the small vessels which naturally transmit globules in single files become so enlarged as to be capable of receiving red blood. We are sure of this from what takes places in ophthalmia. When inflammation is acute, the redness is of the bright scarlet tint of arterial blood, when chronic it is of a darker venous hue. Again, the redness in common inflammation is gradually diffused, while in some specific forms it is abruptly circumscribed.

2*nd Swelling.*—This effect arises from several causes, it may be the result of engorgement of the bloodvessels, or of effusion of coagula-

ble lymph and serum, and deposition of new matter. The degree of swelling in different cases partly depends on the intensity of the inflammation, partly on the nature and texture of the structures affected; it is most remarkable in loose textures, also in the breast, testicle, and lymphatic glands.

3rd Heat.—This is more a sensation than a reality. The heat of inflammation is supposed to depend upon the increased influx of arterial blood, and therefore of oxygen into the part; but it is said never to exceed the heat of the blood at the heart, the natural temperature being usually about 98 or 100° of Farenheit's thermometer. The heat of inflammation is usually less felt, and less complained of by the patient, than the pain.

4th Pain.—The pain of inflammation varies much in different cases, both in degree and kind. It is differently felt by different persons according to their natural susceptibilities. The pain may be attributed partly to a stretching of the nerves by the distended bloodvessels, partly to a disorder of sensation accompanying the disorder of nutrition and secretion. It differs in its character and intensity according to the nature of the exciting cause, and the structure affected; it is accordingly most severe where the surrounding textures are unyielding, as in *whitlow*, and comparatively slight in the lax mucous membranes. Generally speaking there is more pain felt in external inflammations, and in inflammations of investing membranes, than in inflammation of the substance of the viscera, or of the lining membranes. It is important to remark that the pain in inflammation is usually *aggravated by pressure*, this is called *tenderness*, and it helps us to distinguish pain that is inflammatory from that which is not inflammatory, thus pain of the abdomen may result from spasm of the stomach or bowels (colic), and this sort of pain will mostly be relieved by pressure; mere pain will not constitute inflammation.

5th Throbbing.—It has been already stated that the kind and degree of pain differs in its character and intensity in different cases. The pain attending inflammation is generally at first acute or lancinating, afterwards it is a *throbbing* or *pulsatile* pain, and these varieties of pain indicate different stages in the process of inflammation. The sense of throbbing in an inflamed part is explained by the pulsation of the arteries carrying the blood the throb being found to be perfectly synchronous with the pulse. This sensation of throbbing occurs *late* in the process of inflammation, and is generally the precursor to suppuration.

6th Increased sensibility.—Parts, which in the sound state have little or no sensibility, become exquisitely sensible when inflamed; this is

well exemplified in inflammation of tendons, ligaments, cartilages, bones, and dense membranous structures, the pain of which is of a most excruciating kind, as is experienced in inflammation of the dense membranes of the eye and finger.

7*th Disordered function.*—This occurs in almost every case of inflammation. It consists at first in a morbid sensibility to external impressions, and subsequently of an utter incapability of performing the usual offices, in consequence of structural change. The particular symptoms referrible to this head vary according to the organ attacked, thus, inflammation of the brain is indicated by delirium, of the eye and ear by intolerance of light and sound, of the lungs by dyspnœa, and of the kidneys by suppression of urine.

5. *Changes in the blood.*—It is well known that inflammation changes the constitution of the blood itself, and there is one very remarkable circumstance which places this fact beyond a doubt viz., the peculiar appearance of the blood after it has been drawn from a vein, which is almost invariably looked upon as a very important criterion of the presence of inflammation. The blood, when drawn from the living vessels, spontaneously separates into two distinct parts, the serum and the crassamentum. When inflammation exists, the fibrine (which is one of the component parts of the crassamentum), parts with the colouring matter, and upon the deep red clot there is to be seen a layer of a yellowish white colour, varying in thickness,—this is termed the *buffy coat* of the blood, sometimes this buffy coat is flat and wide, but often contracted and of a cup-like form. Such blood is then said to be *cupped.*

But buffy blood sometimes occurs without inflammation, as in pregnancy in the plethoric, and in persons accustomed to be periodically bled. Again buffy blood is no necessary measure of the danger of the disease, for it is constant to the last in rheumatism, and there are certain forms of genuine inflammation in which it does not exist at all, as in inflammations of mucous membranes, in diffuse inflammation of cellular tissue, and in inflammations arising from certain morbid poisons. This buffy coat is also varied by the method by which the blood is abstracted. Blood drawn by leeches or by means of cupping glasses, seldom or never exhibits the buffy coat. Blood is more likely to buff when made to flow in a full stream and when it is received in a deep and narrow vessel.

6. *Constitutional symptoms.*—The constitutional symptoms of inflammation are, under ordinary circumstances, those of fever, viz. increased heat of surface, thirst, frequent, full hard pulse, scanty secretion, &c.

Fever more or less urgent, accompanies almost every kind of inflammation. It varies in degree according to the intensity of the inflammation, and the structure affected, and it is according to the violence or mildness of the accompanying fever, that the inflammation is called either acute, sub-acute, or chronic. The degree of sympathetic disturbance of the system does not always bear a proportion to the importance of the organ affected, or the extent of local disease. Fever may run as high in cynanche tonsillaris as in a severe attack of pleurisy. If there be acute inflammation in a healthy system, the fever will be of an inflammatory character, or as it is commonly called *symptomatic fever.* The leading character of inflammatory fever, that by which the treatment is chiefly regulated, is *hardness of the pulse.*

7. *Terminations.*—Inflammation is said to be sometimes *remittent,* never intermittent, and frequently terminates by critical evacuations.

Inflammation terminates in various ways.

1*st. By Resolution.*—This is the natural termination, it is the simple subsidence of all the inflammatory symptoms, the part resuming its natural condition. It is the most favorable and desirable mode of terminating. Resolution may be sudden or progressive, and is divisible into two kinds, viz. 1st. When the process of resolution is unusually sudden or rapid it is called *delitescence,* and 2dly, when the symptoms of inflammation suddenly quit one part, and immediately afterwards show themselves in another, *metastasis* is said to take place, as frequently happens in rheumatism of the joints, and between the parotid gland and testicle, gonorrheal ophthalmia is another good example. This transference, as it were of morbid action, from one part to another is sometimes viewed as *dangerous,* but sometimes as favorable.

2*d. Suppuration.*—In many instances inflammation does not subside as above described. Supposing the irritating cause not to have been removed, the inflammatory symptoms continue, and are aggravated in degree, the swelling begins to point in the centre, the skin becomes white, and the swelling softer, the pain is of a throbbing kind, and at last the cuticle bursts giving exit to a yellowish cream-like fluid which is called *pus;* upon its escape a considerable abatement of all the local symptoms generally ensues. Pus is said to be nothing else than altered blood, and does not possess any corrosive properties as was formerly supposed.

3*d. Mortification.*—When inflammation instead of terminating in a return to the natural action goes on to the destruction of the part concerned, and is accompanied with symptoms of *hectic fever,* it is said to terminate in *mortification.* This is the worst consequence of common

inflammation. The symptoms of mortification may be divided into two stages. 1st. *Gangrene*, i. e. the *dying* of a part, there is a diminution, but not a total destruction, of the powers of life, this state precedes, and commonly (but not inevitably) terminates in 2*ndly sphacelus*, which signifies an *utter* and *irrecoverable* loss of life. When inflammation is about to terminate in *gangrene*, its redness gradually assumes a darker tint, and becomes of a dark green colour, the heat, sensibility and pain diminish, but the swelling often increases, small vesicles, filled with a thin serum of a *peculiar odour*, arise on its surface. If the *gangrene* proceed to *sphacelus*, the colour becomes quite *black*, the parts become soft, flaccid and cold, and they crepitate when pressed owing to effusion of air, and emit a most *fetid odour*. When the progress of gangrene is arrested, a healthy circulation is re-established up to the very margin of the sphacelated portion, and a bright red line of ulcerative inflammation which separates the living parts from the dead, this is called the *line of demarcation*, the appearance of which affords a most important means of *prognosis*, because it shows that the mischief has ceased, and that there is a disposition to repair its ravages. It is worthy of remark that the arterial and nervous tissues are *little* susceptible to gangrene.

4*th*. *Excessive deposit*.—Besides the above, there are other modes by which inflammation terminate, but they ought rather to be called *effects* or *consequences*, viz., 1st by *effusion of serum*. This consists in the separation of the serous portion of the blood, and its discharge into some part of the body, it is generally produced either by obstruction to the return of venous blood, or by inflammation. Serous effusion takes place chiefly into the interstices of the subcutaneous cellular texture, and into cavities which are lined with serous membranes. In the former situation it occasions a swelling of the part affected, which is smooth, colourless, unless inflammation exists, and pits on pressure. This is œdema or anasarca. It occupies those parts which are most dependent, and changes its place with the position of the body. In the serous sacs it constitutes collections of fluid, which are termed *Dropsies*. This effusion varies with the intensity and nature of the inflammation. The lowest degree of inflammation in these parts merely increases the quantity of their natural secretion. Of serum in serous membranes, of mucus when the mucous surfaces are inflamed, constituting dropsy and diarrhœa. Both these membranes, when the inflammation is more intense, pour out fibrine or pus, thus the pleura secretes fibrine, which glues its surfaces together, and forms permanent adhesions; the same takes place with the peritoneum. The mucous mem-

branes too, in cases of severe inflammation pour out coagulable lymph, which sometimes assumes the shape of the tube in which it is formed, this occurs in croup, in the intestines, uterus, &c. Examples of the effusion of *pus* are, in serous membranes, *empyema*, in that of mucous membranes, *gonorrhea*, &c.

3nd *Effusion of Fibrine*, or of coagulable lymph, constituting adhesions. Coagulable lymph is nothing else than the fibrine separated from the other constituents of the blood, and concreted, as in hepatization of the lungs. When coagulable lymph is poured out between surfaces that are contiguous to one another, adhesions are formed, as in pleurisy and peritonitis. It is by this means that *cuts* are healed. No active congestion takes place in cuts, they are healed by an *excited action*, coagulable lymph is effused in the course of a few hours upon the edges of a cut wound, and they adhere under favorable circumstances, when placed in mutual opposition; this is called healing by the *first intention*.

5th *Excessive Absorption* (*or Atrophy*). This implies an excess in the action of removal over that of depostion in the nutrient vessels. The effect of this is necessarily a diminution in the bulk of the part concerned, which may be either of the surface or the substance. The most common exciting causes of absorption are pressure, and the presence of some foreign matter in the body. It frequently removes fluids into the interstices and cavities, and when adequate to effect this, generally opens a passage for their escape externally, by removing the parieties containing them. to such extent as is necessary for effecting an aperture. Foreign bodies too are very frequently removed by a similar process. It is a curious fact that the absorbing action always takes place in the direction of the nearest external surface, unless an internal one lined with mucous membrane should be very near, when the process proceeds towards it. It is by ulcerative absorption of the surrounding living tissues that sloughs are detached.

8. *Causes of.* The causes of inflammation may be divided into *predisposing*, and *exciting*. The *predisposing* causes may be *constitutional or local*, the *former* depending upon age, sex, plethora, temperament, excess in food, drink, and bodily exertion. The *local* causes are previous inflammation, and original weakness of organization. The *exciting causes* may be divided into those which act *directly* on the part affected, and those which do so through the medium of the system; to the former class belong mechanical and chemical irritants of all sorts. Those which act *indirectly* are cold, certain alterations in the condition of the circulating system, and morbid poisons. Causes, may

also be divided into *common* and *specific*, the former being met with daily, and which act on all constitutions, the latter being unable to affect all constitutions, being peculiar in their origin, and producing a modified inflammation, with a specific train of consequences; as for example the vaccine virus.

9. *Varieties.* Inflammation may be divided into *healthy* and *unhealthy*. Of the *first*, there can be only one kind though divisible into different stages, being that which naturally ensues in healthy constitutions, and restorative in its tendencies, injurious only if excessive or misplaced, and usually concentrated towards one point, whereas the *unhealthy* is essentially destructive, has little or no spontaneous tendency to recovery, and is liable to be diffused widely.

Another general division is into *common* and *specific* inflammation, the *common* arising from ordinary causes acting on healthy constitutions, the *latter* implying, that the affection has some strongly marked peculariity about it, rendering it in some degree independent of such circumstances as would control the progress of common inflammation; such are the poisons of small pox or syphilis, erysipelatous, gouty and rheumatic inflammations. It may arise also because the constitution is unsound, as in scrofula. Inflammation may also be divided into the *acute* and *chronic*, the *acute* being sudden in its seizure, violent in its action, rapid in its termination, and is attended with fever. The *chronic* is less violent and more tardy. Acute inflammation is sometimes called active, and the term passive is applied to chronic inflammations;—in weak constitutions chronic inflammation is always looked upon as more dangerous than the acute,—it may terminate by effusion, suppuration or mortification.

10. *Uses of.* Inflammation is an action peculiar to life. In numerous intances it is a salutary process, inasmuch as it acts in *preventing*, *removing* or *repairing* the consequences of injury or disease. Frequently however, it becomes hurtful, dangerous, and even fatal, either from excessive violence or from its complication with disease. The reparative processes of inflammation may be divided into three kinds, 1st. The adhesion of the sides of a wound by a medium of coagulable lymph, or of a clot of blood, 2nd. Reparation without any medium of lymph or granulations, the cavity of the wound being filled up by a natural process of growth from its walls, 3rd. Reparation by means of a new, vascular, and organized substance, termed granulations. The first of these modes is that which is ordinarily termed *union by the first intention*. Of this kind of adhesion, the healing of the incision made in venesection, which usually

takes place almost without consciousness on the part of the patient and with scarcely any inflammation, is a very good example. Inflammation used to be considered esssential to this mode of union, which was said to be effected by adhesive inflammation. It is now ascertained that inflammation, so far from being essential to the process, is completely subversive of it, a *certain* degree of excitement short of full inflammation being all that is required.

The salutary effects of inflammation in *preventing* more serious and even fatal mischief is often exemplified by the process of adhesion, although they sometimes have a detrimental influence, vision may no doubt be destroyed by a plug of lymph which shuts up the pupil of the eye, but it is better that the bag surrounding the heart, when it happens to be inflamed should be adherent to that organ, than that the inflammation should run on to suppuration, and fill the pericardium, and oppress the heart with pus. It is more desirable, and more consistent with the safety and comfort of the patient that his lungs should be fastened to his ribs than that they should be compressed and flattened against his vertebral column. When an opening is made in any of the hollow viscera either by ulceration or violence, the escape of their contents into the cavity of the peritoneum which would be sure to excite a fatal attack of peritonitis, is frequently prevented by a slight inflammation taking place round the opening, followed by a close adhesion of the margins of such opening to the contiguous part. The salutary effects of this process is well illustrated by the line of demarcation in a mortified limb. *Granulation*, this term is applied to an action which repairs breaches in the continuity of the surface that are not healed by primary union, this takes place whenever union by the first intention is frustrated.

11. *Treatment.*—The treatment of inflammation may be divided into *constitutional* and *local*. The remedies which belong to the *former* class are bloodletting, general and local, antimonials, opium, purgatives, mercurials, digitalis, and colchicum.

The *local* remedies are bleeding by leeches, cupping, incision, poultices &c.

1st. *Constitutional.*—The first and great object in treating inflammation is, if possible to obtain resolution, the most favorable termination, 2ndly. In external inflammations, suppuration will generally next to resolution, be the most desirable event. 3rdly In internal inflammations, our object will be sometimes suppuration, sometimes adhesion. A knowledge of the cause of diseases assists us greatly in the treatment. Knowing the cause, the first step must be to remove

it if we can. This should be invariably done before we begin any treatment, and there are several circumstances which will, if properly attended to, assist us in effecting a perfect cure; but there are some instances in which the removal of the exciting cause is impracticable, as when a bullet is lodged in any of the cavities. The position of the part inflamed should be attended to; in whitlow if the finger be left dependent, inflammation would be increased, in inflammation of the head the head should be well raised, and perfect rest should be enjoined.

The diet and drink of a patient should also be particularly attended to, these should be regulated by the strength of the patient, and other modifying circumstances; the temperature of the part should also be kept equal,—mental tranquility is also necessary.

Bloodletting.—Of all the direct remedies of inflammation, the abstraction of blood locally or generally, is by much the most effectual and important. But it is not every case that requires or warrants the abstraction of blood. Blood may be withdrawn *locally* from the inflamed part or its neighbourhood by cupping, leeches, &c., and generally from the larger veins or smaller arteries.

Indications for bloodletting.—We are guided very much by the degree of pyrexia. We are to attend to the age of a patient; during the first year of a child's life it should not be bled, nor should we bleed beyond 60 in the old man. We are guided very much by the quality of the pulse, by the importance of the organ affected, by the intensity of the inflammation, by the period or stage of the disease, by the sex and general condition of the patient. Scrofulous diseases, occupation, residence, habits, climate, should all be taken into consideration.

The great object of general bleeding is to diminish the whole quantity of blood in the system, and thus to lessen the force of the heart's action, and this should be effected with as little loss of blood as possible, especially in persons who are extremely debilitated, whom it is often necessary to bleed when suffering from acute diseases. For this purpose the blood should be drawn as quickly as possible, from a large orifice, and above all the patient should sit or stand upright. As a general rule, the blood should be permitted to flow till the approach of of syncope but *full* syncope should always be avoided as the powers of the system may not be able to bear up against the subsequent reaction, or it would most likely prove instantly fatal, should there happen to exist any serious disease of the heart.

Reaction.—After the depressing effects of bleeding, a degree of reaction naturally follows, the pulse rising in frequency, and the local

pain returning, but this reaction should if possible, be restrained by sedatives, and antimonials.

It is generally found that the abstraction of blood from the system is more especially necessary in inflammation of important organs, as of the brain, pulmonary and abdominal viscera, in which diseases it forms in Europeans at least the principal means of cure. The quantity of blood requisite to be taken in order to produce the desired effect is very various, being regulated in proportion to the exigency of the case. *General* bleeding is best adapted to *acute* inflammations, and *topical* bleeding is most appropriate in *chronic*, but the combination of the two is often necessary and highly useful.

Buffy blood.—With respect to the buffy coat of the blood, it may be observed that it is not by the buffy coat alone, but by the buffy coat in conjunction with the quantity and firmness of the coagulum, that we must judge of the propriety of any further depletion.

Local depletion.—The local means of abstracting blood are by leeches, cupping, and scarification. It is always a point worthy of consideration, whether topical bleeding, will answer better, than taking blood from the general habit. This mode of bloodletting is employed in preference to the general abstraction of blood from the system in the following cases, 1st. When the amount of inflammation is trivial. 2dly, When the powers of the patient are too weak to admit of general bleeding. 3rdly, When the active stage of inflammation is past. 4thly, As an auxiliary to general bloodletting. And as a general rule in the less active circulation of the natives of India. Topical bleeding is sometimes so conducted as to have the effect of a general bleeding, this of course depends upon the quantity of blood which may be taken away at once. There are certain precautions which should be particularly attended to in employing leeches, 1st. We should be very careful in applying them to children, as it is sometimes difficult to stop the bleeding; but if they must be applied, it is always best to do so over a bone, as hæmorrhage will be more easily restrained, 2dly. Certain classes of persons should never be leeched, as those of a hæmorrhagic tendency, a diathesis which is known by large blotches on the body. 3dly, Leeches should never be applied to the eyelids, when their use is required they should be applied to the temples instead.

12. *Use and abuse of mercurials in inflammation.*

Mercury as a remedy, is of very superior value in serious inflammations of various kinds. It possesses a specific power in controlling inflammatory action, especially in acute, phlegmonous adhesive inflammations, such as glues parts together and spoils the texture of organs.

Mercury is frequently prescribed either in conjunction with blood-letting, or without it when this evacuation is deemed unadvisable. Mercury acts beneficially in two ways, it acts on the principle of *revulsion* or *derivation*, by causing an increased secretion in the vessels of the bowels, and secondly as a *sedative*. It is chiefly advantageous in idiopathic inflammations of serous structures with a tendency to adhesion; but in such cases it is used only as an auxiliary to blood-letting. The form in which mercury is usually administered is calomel, and to prevent its running off by the bowels a small proportion of opium is generally combined with it. The great remedial property of mercury is its power in arresting the deposition of coagulable lymph, and generally in checking the course of inflammatory disorganization, which is strikingly displayed in iritis, pneumonia, and pericarditis. Its efficacy in inflammations of the larynx, trachea, testicle, synovial membranes, and various internal organs is daily exemplified. To obtain the beneficial effects of mercury it is not necessary that *salivation* should be excited, it is sufficient to produce slight tenderness of the gums, but if you push this remedy further, it is generally attended with most serious results. Mercury is likely to be *injurious* in those forms of disease where the morbid action approximates to its own action, in cases for example of erysipelatous inflammation having a disposition to gangrene, in inflammation the result of venomous bites, dissection wounds, or where any foreign body exists in scrofulous constitutions, or in mercurio-syphylitic affections, &c.

The *local* remedies are leeches, cupping, punctures and incisions, counter-irritants, poultices, fomentations, &c.

When inflammation assumes a chronic form counter-irritants are more useful, especially those which establish a permanent suppurrative discharge, such as vesicants, setons, &c. Blisters should never be applied over the inflamed part, as it tends to increase the irritation already existing; it should be applied near the affected part. Children do not stand blisters well; but when their use is indispensable, they should be kept on only for three or four hours, and then a large poultice should be applied to bring the blister forward. The nitrate of silver is also a very good counter irritant.

ARTICLE II.—*Intermittent fever.* By Assistant Apothecary G. NORTON.—Continued from page 88, No. 2.

Pernicious Intermittents are characterized by a greater degree of severity of all the symptoms, longer continuance of the cold stages, and feebleness of reaction in the second or hot stage. There occur great prostration of the vital powers, a peculiar expression of countenance, languid circulation, feebleness of the heart's action, loss of sensation, involuntary discharges from the bladder and bowels, &c. &c., symptoms denoting serious implication of some important organs. Each subsequent paroxysm increases the intensity of these symptoms; the apyrexia instead of being one of comparative health is imperfect, attended with languour, stupor and other signs of serious illness. To this form of intermittent fever, the epithet *congestive* has been applied by most writers.

Causes of Intermittents.—These are cold, and malaria or marsh miasm; both are exciting causes. The first is common to other diseases, the latter exercises a peculiar and specific action. The effect of cold on the animal economy at first produces a constriction of the capillary and exhalant vessels of the skin, which becomes corrugated. The blocking up or constringing of the cutaneous pores by the continuance of the cause, suppresses the cutaneous transpiration, and derangement to the balance of the circulation consequently takes place. The sentient extremities of the nerves of the periphery convey the morbid sensation through their trunks to the cerebro-spinal centres; these last reflect back the impression to the surface, and if the exciting cause remain persistent, awaken the associations that exist between the organic system of nerves (the great sympathetic and its ganglia) distributed to the internal organs, through the numerous connections that exist with the two great nervous systems of animal and organic life. The repetition of these nervous impulsions and radiations, is followed by a concentration of force, which may be localized in any one organ, the result in that case being a visceral phlegmasia, as pneumonia, &c.; or the disturbance produced may be participated in by several organs at the same time, not by all in an equal degree, by some more than others, and thus give rise to fevers by a derangement of their functions, by irritation, congestion or inflammation of their tissues. How the type or form of fever is determined by the exciting cause, I have no knowledge. It perhaps has something to do with local and endemic influences, and to the effect produced on the nervous system; but to what

extent, how related and modified, our advances in physiology on this subject do not admit of explaining satisfactorily. As a general rule, it may be remarked that those fevers in which the nervous symptoms predominate are the most severe, have a more dangerous tendency, and take a longer time to run their course or arrive at their crisis.

It is affirmed by some medical men that cold of itself is not sufficient to produce intermittent fevers. This assertion is not strictly borne out by experience: there are occasional circumstances where cold engenders this class of diseases, as the following particulars will serve to illustrate:

I embarked on board the Ship "Duke of Bedford," with two companies of the 2d M. N. I. at Madras, on the 10th of April 1842. We weighed anchor on the afternoon of the same day; our destination was China via the Straits of Malacca. We had pleasant weather, light breezes, a cloudless sky and clear nights, till we came in sight of the numerous islands which stud the entrance into the harbour of Singapore, which place we had to touch, being the rendezvous for all vessels proceeding to join the expedition. When we were within a few days sail of this station, we experienced change of weather, the days became very hot, nights oppressive, heavy clouds in the horizon, occasional brisk showers of rain with sharp thunder and lightning. We reached Singapore at the close of the month, and anchored in the harbour about a week; after replenishing our stock of water and fuel, we sailed into the China sea; the weather continued pretty much the same, except that the oppressive heat of day was succeeded by dewy nights and occasional haze. The first signs of disease became manifest on board. Some of the sepoys were attacked with slight ague and fever, the first few cases were followed by others, and the disease continued so long as the dewy nights lasted. I particularly remarked, that those who slept on deck, exposed to the influence of the night air were the individuals principally attacked. The operation of malaria or febrific miasm was here out of the question, as it is generally admitted that such a cause is unknown in producing febrile disease on the wide expanse of the ocean. It may be argued that we caught the malarious influence during our short stay in the harbour of Singapore, that it had lain dormant, and showed its effects after a while. There does not appear to me to be sufficient foundation for such a supposition, because, when in the harbor, I went on shore on the island, and was not informed that intermittent fever prevailed there at the time, though the town in some places was in a bad state of cleanliness. If then we put aside malaria as having produced the fever in those attacked on board, cold no doubt was the exciting agent, as was evidenced by the dewy nights,

and the influence of the exciting cause operating on those principally who exposed themselves to the humid atmosphere of the night. This opinion is further strengthened by the subsidence of the disease, when a sharp look out was kept on deck, preventing people from sleeping exposed to the open air. The character of the fever was extremely mild, an emetic, a purgative, and one or two doses of disulphate of quinine, or powdered cinchona during the apyrexial period, were sufficient to subdue the disease.

Malaria.—On this subject we have much yet to learn; notwithstanding that a great deal has been written about it, the laws of endemic influence alone have been studied with any degree of satisfaction. Of the nature of this operating cause, we are ignorant. We know it by its effects, beyond which all is veiled in mystery. Some have ascribed malaria to be an ethereal essence, others have given it a tangible form, emanating from the decomposition of organic matter, vegetable and animal exuviæ or larvæ in a state of decay superadded to moisture, and exhalations from the surface and fissures of the earth; turning up new earth in soils under cultivation, principally paddy fields of rice, conjoined with solar and lunar influences during certain seasons of the year, is said to give rise to malaria. In this country, during the monsoons or, shortly after the monsoons have ceased, is the time in which fever is most prevalent. Whatever be its nature, the influence it exercises on the health of man, in several local habitations is an indisputable proof of an unknown cause operating in the production of *marsh fever, malarious fever*, which are other names for what is usually termed *intermittent fever:* the two first beingexpressive of the supposed cause of the disease; the latter of the form it assumes in its development.

It would be waste of time to enter into discussion of a subject involved in obscurity; and were I so disposed, the limits of this treatise would not permit it. All that is known about it is fully and ably treated of by systematic writers on medicine; and the reader desirous of such information may consult with advantage Copland's Dictionary of Practical Medicine, articles "Endemic Influence"; and "Disease, Causation of." Annesley's Diseases of India, Watson's Practice of Medicine, Craigie's Practice of Medicine, MacCulloch on Remittent and Intermittent Diseases, &c.

Pathology of Intermittents.—All that has been advanced under this head is hypothetical. The association of functions that in the healthy state of man's existence, the disturbance that results by disorder, which in fevers is not limited to any particular organ or function, but involves many, and the complications that take place in

the progress of febrile disease, render it difficult if not impossible to ascertain with any degree of precision, what are the primary, and what the secondary lesions that occur in the course of the disease. Among the numerous opinions that have been entertained on this subject, the following are the principal, condensed from Dr. Good's study of medicine.

The ancients regarded fever as a concoction of the humors, a species of fermentation, by which the human constitution made an inward struggle to rid itself of effete or morbific matter, which they supposed had accumulated in the system. The crises which very often take place in cases of fever favored this doctrine. We frequently observe in the progress of febrile diseases the abatement of more urgent symptoms, and sometimes the subsidence altogether of the malady on the appearance of certain rashes and other eruptive disorders, for instance, the exanthemata, circular or diffused blotches of a scarlet or purple color, (several cases of this description came under my observation and practice, a few of them of a very severe character, the intensity of the symptoms being such as to threaten dissolution), hæmorrhage from the nose, discharges from the bowels (diarrhœa) &c. In a few, sores break out on some part of the body, and these when healed incautiously, reproduce the fever or some more dangerous disease. These circumstances no doubt influenced the opinion of the ancients, and reasoning simply from observation they drew their conclusions, without the help of that anatomical and physiological knowledge we now possess. The mind of man ever prone to discuss the nature of things, is not satisfied with the simple observation of facts ; it seeks a reason for every passing event, and hence arose the theories that from time to time agitated the various Medical Schools of note as to the essential cause of fever.

The doctrine of the concoction of morbific matter as generating fever prevailed in the early periods of medicine for the space of about 3000 years, from the times of Hippocrates to Sydenham. Galen supported it with all the ability and learning for which he was distinguished in his day. To it succeeded one advanced by Boerhave, who based his doctrine on a peculiar crasis or *lentor* of the blood. Availing himself probably of some discoveries that had been then made by Leeuwenhoeck in corpuscular physiology, Boerhave described fever as being produced by a viscid state of the blood (*lentor*), the grosser corpuscles of which erred from their regular course (*error loci*), and forced themselves into a series of vessels to which they did not properly belong in the healthy

state; the undue momentum exercised thereby, and the increased quantity of grosser particles he conceived, caused stagnation in the extremities of the capillaries, and gave rise to the cold stage of fever, which was consequently followed by the other stages. This theory soon became popular, and completely overthrew that of the Greek Schools. It received some confirmation from the peculiar dense character of the clot of the blood drawn in some cases of inflammatory fever, to which is superadded the buffy crust. But it is needless to remark, that there are numerous cases of fever where the clot of the blood has no such appearance, on the contrary, the crassamentum is of a loose texture easily broken down, and in one case that occurred under my observation, a young man, the blood was claret colored, little more consistent of water, no clot had formed by keeping; this however was no case by which to form a judgment, as the patient when bled, had been laboring some days previously with the disease, and during that time was under treatment. The buffy nature of the blood in pregnant women is of itself an irreconcilable argument against the hypothesis of Boerhave.

Next in order the nervous system was taken into account by Stahl, Hoffman and Cullen in explaining the proximate cause of fever. Stahl ascribed fever to a tonic spasm of the brain, producing torpor or inertness of that organ, the remedial powers of the mind labored to throw off the assailing power, and the commotion that ensued characterized the febrile paroxysm. Hoffman followed the steps of Stahl, and instead of seating the conservative power in the mind, placed it in the whole organization. The tonic spasm of Stahl was changed to spasm of the periphery. He called into play two additional powers, the irritability of the muscular fibre, which he named *vis insita*, and *vis nervea* derived from the nervous fibre.

The ingenious theory devised by Cullen is founded on the preceding. According to him the human body is not a machine set in motion by the laws of inanimate life, but there exists a mobile and conservative power seated in the brain, distinct from the soul and mind, exercising a general control or superintendence over the functions of organic life, correcting deviations from the standard of health, and supplying what is necessary. This influence he conceived was exercised through the medium of the moving fibres, on the state of which depends the healthiness or unhealthiness of the frame. With Stahl he regarded the fibres as the nerves, and rejected the independent nature of the *vis insita* of Hoffman. According to this hypothesis the brain is the

primum mobile of all action, and the presiding or conservative principle is an immaterial agent. The proximate cause of fever in the opinion of Cullen was a diminished energy of the brain, produced by certain sedative powers, as contagion, miasm, cold, fear, this diminished energy extends its influence to the whole system, giving rise to debility and spasm of the extreme capillaries, on which the cold fit is supposed to depend. The debility induced indirectly rouses into action the sanguiferous system, which restores the energy of the brain, and overcomes the spasm, the hot stage being the result of such action, and the sweating stage which put an end to the struggle indicates the subsidence of the spasm and relaxation of the capillaries.

The theory of Brown and Darwin is founded on the doctrine of accumulated and exhausted excitability or sensorial power. In a preceding page (5), a brief view was taken of the doctrine inculcated by Brown. That of Darwin is a more refined modification of Brown's theory, the essential difference consisting in regarding the brain as the reservoir or fountain from which the living frame is capable of recruiting itself after exhaustion or collapse. The brain, according to Darwin is a secreting organ, the peculiar nature of which secretion is capable of being propagated to the different parts of the organism, by certain agencies or powers not very intelligible. Darwin considered that fever was produced by the causes inducing a torpor of the extreme capillaries, and the heat that followed as the inordinate exertion of the sensorial power accumulated to excess.

All these doctrines have now become obsolete. The prevailing opinion in the present day is, that fever is a local disease dependent on inflammation of some particular organ. This opinion is pretty general, especially among Physicians on the Continent of Europe. Dr. Clutterback (of England) regarded fever as an inflammation of the brain. Broussais (of France) states that it commences in inflammation of the mucous membrane of the stomach and intestines. MM. Bretonneaux, Petit, Serres, Louis, and other distinguished observers, affirm that inflammation of the mucous follicles and glands of the intestinal passages is an almost universal appearance on dissection of those who die of fever. Many Physicians state that idiopathic fevers are produced by a diseased state of the blood and nervous system. These conflicting opinions are open to dispute; they are by no means settled, the subject is one of considerable difficulty, and there still remains ample room for patient and persevering inquiry.

Morbid Anatomy.—Of 521 cases of fever, selected by Dr. Tweedie, from the records of the London fever hospital.

163 were not apparently complicated with local inflammation of any organ.
114 were complicated with cerebral affection.
103 „ „ with thoracic affection.
71 „ „ with abdominal affection.
26 „ „ with cerebral and thoracic affection.
30 „ „ with cerebral and abdominal affection.
14 „ „ with cerebral, thoracic and abdominal affection.

Pathological anatomy does not throw much light on the nature of intermittent fever. M. Bailly visited Rome with the express purpose of determining if possible the seat of the disease, the result was not satisfactory. His researches are as follow:

In 33 cases of more or less disease of the brain, { 22 had thickening and other marks of inflammation of the arachnoid; 11 inflammation of the substance of the brain.

In 20 cases of gastro-enteritis, { 4 had gastritis alone, and 4 enteritis alone.

In 11 the spleen was softened; in some instances enlarged, one weighed from 2 to 3 lbs. and another from 8 to 10 lbs.

In 2 cases the spleen was hypertrophied and indurated.

In 3 it was ruptured, and in one it was gorged with blood.

In 2 cases the liver was softened; in 4 gorged with blood; and in one case the gall bladder was inflamed.

In 2 cases there was pericarditis.

In 3 peritonitis.

In 1 pneumonitis.

In 1 inflammation and enlargement of the parotid.

From the above we learn that the viscera contained in the three great cavities are all liable to inflammation in intermittent fever. Whether these morbid appearances are primary or secondary occurring in the course of the disease is difficult to determine, one thing is remarkable that the brain and abdominal viscera are more generally affected than the thoracic organs. The intimate relation existing between the brain and stomach may in some measure account for this, and it is not improbable that inflammation originating in the gastro-enteric passages may be propagated to the brain, either by sympathy or revulsion, the stomach and intestines themselves being relieved of the inflammatory action. This, if I am not mistaken, was the opinion of Broussais. Those who have studied the sympathies of these two organs, will see no difficulty in the explanation here offered. "Every regular paroxysm of an intermittent," said Broussais, "is the sign of a gastro-enteritis, the irritation of which is afterwards transferred to the cutaneous exhalants, which produces the crisis." There is much obscurity as to the proximate cause of intermittents, of the laws that govern the periodical recurrence of agues we are ignorant.

PART SECOND.

Notes of Professor A. BLACKLOCK'S Lectures on Medical Jurisprudence, by Senior Student C. GEORGES.

COURTS OF JUSTICE.

When the Coroner's Jury returns a verdict of murder or manslaughter, the Coroner either issues a warrant for the apprehension of the accused party and commits him to prison, or if the party be already in prison the Coroner issues a detainer to the gaoler in whose custody he is. The Coroner having put in writing so much of the evidence given to the Jury before him on the Inquest, and having bound over all persons, who know or declare anything about the murder or other crime, to appear at the next Court of Oyer and Terminer to give evidence against the party charged, certifies and subscribes the evi-evidence, recognizances and inquisition taken before him and delivers them to the proper officer of the Court in which the trial is to take place. The depositions are brought by the Clerk of Assize before the Judge who is to preside at the trial, so that he may examine the facts of the case and be able to explain any difficulties that may exist to the Grand Jury, and inform them of the law applicable to the facts.* The Judge brings the case before the Grand Jury at the first Session of Oyer and Terminer and general gaol delivery. Oyer and Terminer are French words signifying to hear and determine or bring to a conclusion. In former times English Law proceedings were conducted in the French language and hence many old French words are still used in our law Courts.

The Grand Jury consists of twenty four good men of substance or property who have to examine the indictments against the prisoners in the gaol. If they find that the charges cannot be sustained, the foreman writes on the Bill of indictment "not found" or in law language "ignores the Bill;" but if the Grand Jury find that the indictment is worthy of more careful examination before another or Petty Jury they then find the indictment to be a "True Bill". When the case comes to actual trial it is brought before the Petty Jury which is composed of twelve Members who are required to find a verdict for or against the prisoner of "guilty" or "not guilty." They must also be unanimous in their verdict and great delay often occurs owing to the necessity for unanimity. This difficulty is not experienced in Scotland, as a Jury is there composed of fifteen Members a majority of whom settle the question one way or another; and their duty is also rendered easier by their not being restricted merely to verdicts of guilty or not guilty; but, where they have a doubt, and it is not in favor of the prisoner, they are allowed to return a verdict of "not proven."

* Jervis on the Office of Coroners, 272.

In England, the Sheriff's Slip of parchment, on which the Jurymen's names are inscribed, is called a Panel ; but this word is most commonly applied to the Jurymen themselves who, when brought together and sworn in are said to be empanelled. In Scotland the prisoner is called the Panel, and you require to remember this when reading extracts from cases which have been decided in the Scotch Courts.

A prisoner can object to any of the Jury or to the whole if he have a good reason for so doing, and he usually makes the objection through his Counsel. If he object to one he is said to challenge the Poll: if he object to the whole Jury, he is said to challenge the Array. Certain circumstances disqualify a man for serving as a Juror, the chief of which are atheism, immorality, known bias for or against the prisoner or defendant, informality of the warrant, or having been present at the Inquest.

When a case is to appear before a Court, for adjudication by a Jury, the witnesses are brought together by a writ or subpœna being sent to each person. This is usually called a " subpœna ad testificandum" or a writ to appear to bear witness under pain of some punishment in case of non-appearance. In Scotland the summons is called a warrant of citation. By the subpœna the witness is required to appear at a fixed time and place to give evidence of what he knows about the particular case under a penalty of £100 or 250 star pagodas, to be forfeited to the Queen if he do not appear, or of imprisonment if he cannot pay the money.

In the territories *dependent* upon the Presidency, cases in which the local Magistracy are not empowered to take cognizance are committed for trial to the Subordinate Criminal Courts* and are eventually submitted to the Court of Foujdaree Udalut which was established for the trial, in the last resort, of criminal cases referred to them for thier final sentence, and for the general superintendence of the lower Courts.†

Witnesses are always sworn in Court prior to giving evidence. The oath which a christian witness takes in an English Court is " I swear that the evidence I shall now give shall be the truth, and nothing but the truth, so help me God." After repeating this he kisses the new Testament. The oath is administered by one of the Subordinate officers of the Court. In Scotland the Judge himself administers the oath and the manner in which it is administered, and its wording, cannot but impress upon all who hear it a very grave and serious idea of its solemnity. The Judge stands up and tells the witness to hold up his right hand and to repeat after him the following words, " I swear by Almighty God, and as I shall answer to God at the great day of judgement, that the evidence I shall now give shall be the truth and nothing but the truth, in so far as I know and shall be asked."‡ After

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* Arbuthnot's Select Reports, p. p. xix & xxi.

† Ibid, p. xi.

‡ These oaths, were abolished in 1840, and affirmation substituted in their stead while the penalties of perjury remained. The natives of India have long long been averse to swearing ; and an oath is considered derogatory to their dignity and honor. " No native of respectability, therefore, would attend our Courts ; and with the

the oath is thus administered the witness is asked if he has any prejudice for or against the prisoner, or if any person has told him what to say; for if he have any bias, or if any one have told him what to say, his evidence will not be taken.

Before a child is sworn in he is questioned by the judge as to the meaning of an oath, and whether he is aware of the existence of God, he is also asked if he understand his relations to the Supreme Being and if he know that there is a world to come.

The Law requiries all Christians to take oaths except Quakers who are allowed to give evidence after simply affirming they will tell the truth. Jews are sworn on the Pentateuch, Mussulmen on the Koran, Hindoos on Ganges water or the Toolsee Plant. Gentoos are said not to consider an oath binding unless they hold the foot of a Brahmin while they are swearing.

According to Arbuthnot* the English Law of evidence is now the guide of the Indian Courts in the trial of Criminal cases though in practice a strict adherence to it has been found impracticable from "the character of the people rendering it unsafe, in some instances, to found a conviction upon evidence which, according to the law of England, would be considered amply sufficient; while the existing state of things has rendered it necessary to admit the testimony of particular classes of persons, whose evidence, according to the Law of England, cannot be removed." For example, a confession made before a Native Police Officer, uncorroborated by other evidence, cannot be held snfficient for the conviction of the accused and a confession before a Court of Circuit has been considered insufficient for conviction in the absence of proof that the crime charged had been actually committed. Husband and wife are also considered to be competent witness for or

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hope of surmounting their objections, the affirmation was substituted. The measure has signally failed. A respectable native is as averse as ever to appear in court, while the only check upon the lower orders has been abolished. The penalties of perjury are being daily incurred by men, who have in thier own opinion committed no crime. To lie is fashionable and, no crime; but to have the lie detected is disgraceful though meriting only in their eyes contempt, not punishment."—*Calcutta Review for* 1849, *p.* 537."

"The Regulations of the Court enjoin the repeated callling of the witness' attention to the obligation imposed on him by his affirmation."

Act No. V. of 1840 is a General Act applicable to all the Presidencies and applies to Madras. A much esteemed friend in extensive legal practice informs me that "this Act of the Legislative Council is rather loosely worded. The 4th Section says it is not to apply to any declaration or affirmation made in any of Her Majesty's Courts of Justice. It does not say, in any of Her Majesty's Courts established by Royal Charter, but simply in any of Her Majesty's Courts." Again, with reference to a mistake of mine while speaking of oaths in Coroner's Couts. 'The question then resolves itself into this;—Is the Coroner's Court one of Her Majesty's Courts of Justice? If it is, the witnesses must be sworn. If not they may be affirmed. The Court of the Coroner is a Court of Record and is reckoned among the criminal Courts of the nation (Stephen's Commentaries vol. iv, p. 369) the Coroner's Jury must hear such evidence as is offered either on the part of the Crown or of the party suspected, and it is to be given upon oath, (vol. ii. p. 604) I am of opinion that native witnesses ought to be sworn on Coroner's Inquests, and all the depositions I have seen of evidence taken on Inquests profess to be taken on oath."

* Select Reports of Cases in the Court of Foujdaree; Preface, and p. 26 & 27.

against each other; therefore, where sufficient evidence can be obtained from other quarters it is considered objectionable to make use of the evidence of parties so situated. Comparative laxity of the marriage tie from various causes is the reason assigned.

The evidence laid before Courts is of two kinds, legal evidence and medical evidence. Any fact submitted to the Court, if it be a true fact bearing on the proceedings before the jury, is called evidence or legal evidence; but medical evidence consists of any fact or facts which could have been obtained only by a knowledge of the various branches of which the science of medicine is made up. A medical witness may, therefore, be called to give merely legal evidence, that is to say to speak to facts which might have been obtained by any person of ordinary understanding, or he may be required to afford medico-legal information, in other words he may have to furnish facts which could have been obtained only by one possessed of medical or medico-legal acquirements. Testimony is sometimes confounded with evidence. It signifies merely witness bearing. Testimony is sometimes evidence, or rather evidence is sometimes contained in the testimony of a witness before a Court; but testimony is not always evidence, for no testimony can be called evidence which does not contain facts bearing upon the case before the Court, in other words that does not contain some facts, likely to render the guilt or innocency of a party *evident* to the judge and jury.

Witnesses may either bring forward false facts that is to say may state what never occurred, or they may state what are really true facts or things that actually happened. In the former case he is said to give fallacious evidence, the witness does not know the facts he is stating to be false.

If he knows it to be false he perjures himself, and exposes himself to all the penalties for perjury, by making the statement. In either way, however, the witness is sure to mislead the jury, for a time at least, by giving facts which never occurred, or by misrepresenting facts which actually occurred. And as the decision of the jury is founded on the evidence, their judgment will be either correct according to the truthfulness of the morals and accuracy of the descriptive powers of the witnesses, or incorrect in accordance with their disregard of truth and their carelessness in misrepresenting or mistating the actual facts or occurrences. Hence in the words of Dr. Southwood Smith* "the extreme importance of guarding against description liable to be produced by fallacious evidence; and the necessity that you, who, as a skilled witness, are to collect and state evidence in relation to numerous questions, some of them of the greatest delicacy, difficulty and importance, which are ever presented to the judges of the law for their decision, should be able to form a correct judgment of the probative force of evidence, and should take the necessary securities that the evidence you deliver possess the highest attainable degree of probative force; that is, be in the highest degree trustworthy." That evidence be possessed of probative force, or be really truly a proof of what it is intended to prove, it must be :—

1st Correct evidence, or a truthful representation of what actually

* Medical Gazette, New Series Vol. 1, 1837-38 p. 402.

came under your observation. For example, you might state in evidence of a person having been killed by a blow on the head that you found puffiness and ecchymosis of the scalp, with blood effused and coagulated between the dura mater and the cranium ; but to render this really correct evidence, you would have to be certain that you had not mistaken sugillation, a post mortem appearance, for ecchymosis produced during life, and that the effusion of blood within the skull had really been coagulated on the outer surface of the dura mater, or again, you might state that you had found portions of intestines gangrenous and lurid red, and might found an opinion on these appearances to the effect that the patient had died of inflammation of these viscera brought on by a blow or by acrid poison, while all the time the appearances of the intestine were entirely owing to ordinary putrifaction, you cannot be too careful, therefore, in noting down every appearance which may have been occasioned by natural causes or by mechanical or chemical injury, and you must be careful to assign the true value to these appearances when expressing your opinion on them before the Court. Where you have a doubt as to the meaning of any appearances you may have seen at a post mortem, you must take care to state to the Court that you cannot give a decided opinion, and the Court will not fail to give the prisoner the benefit of the doubt.

2ndly. Your evidence to be trustworthy must be perfect and complete. For example, you might state to a Court that you had no doubt but that the deceased had died from the blow, the marks of which you describe as having found on the head, and yet another medical witness may follow you with evidence to show that the deceased really died from suffocation occasioned by a large piece of food, which he was eating at the time of the quarrel, being impacted in the œsophagus. Cases of this kind have actually occurred and show us how anxious we should be to investigate most carefully all cases which are likely to be brought before a legal tribunal, and how determined we ought to be to have our knowledge of the case complete in every point so far as it is possible for medical sagacity to render it so.

The probative force of evidence is always strengthened by the witness having a reputation for superior acquirements on the subject on which he is giving evidence, or from his being supposed to possess more than ordinary sagacity. It is also strengthened by more than one witness being able to speak to the same point, and the more numerous and unanimous the witnesses, the more trustworthy may the evidence be considered. The force of proof by evidence is always weakened when the witness has the slightest appearance of not understanding the subject on which he is speaking, or by his being an immoral character or having any known bias.

Two kinds of evidence are usually brought before Courts of Law and Inquests, direct evidence and circumstantial evidence. Direct evidence in a case of murder would be evidence of having seen the murderer actually commit the murder. In a case of poisoning he who could swear to having seen the criminal actually administer the poison to the deceased would be said to give direct evidence. This kind of evidence is evidence of having seen the deed really done, and

applies only to persons ; and there is another somewhat similar kind of evidence called real* evidence which applies only to things, as for example where a person supposed to have poisoned another is found with sweetmeats containing arsenic. Or you may understand direct and real evidence in this way :—Direct evidence is what is said in proof of having seen the murderer actually administer the arsenic, and real evidence is the deposition to the finding arsenic and the lesions usually caused by it in the stomach and bowels.

Real evidence is in this way more easily obtainable than direct evidence. The latter is seldom tendered in Court in a criminal prosecution for the best of all reasons that those who perpetrate crimes take every precaution to prevent any one being directly cognizant of their crime ; in fact crime would seldom be committed were a living witness always present to give evidence of its commission.

The guilt or innocence of an accused party before a Court is usually established by circumstantial evidence, or by what is called the presumptive evidence which flows from the narration of the circumstantial evidence. When a person is condemned on the strength of circumstantial evidence, the case is proved against him, not by any one who has seen him commit the crime, but by presumptions which follow naturally from the evidence of those who can speak as to various circumstances which happened at the time the crime is supposed to have been committed. A case reported in a recent English Newspaper† is a good illustration of the nature of circumstantial evidence. A woman, named Mary Rogers, carrying her illegitimate child, about 2 months old, along a road, in company with two female friends parted from these friends about 3 o'clock in the afternoon. She said she was going to the house of a Mr. Rogers and she turned down a lane which led in the direction of a pool in which the child was afterwards found. One of these friends was returning along the same road in the evening when she was overtaken by Mary Rogers without the child. When asked where the child was, she said she had left it behind, wishing it evidently to be understood by this phrase that she had left it at the house of Mr. Rogers. On the same evening, about 7 o'clock, a farmer in the neighbourhood was going round his farm. He came near the dam of a pool in a remote hollow, surrounded by a few trees, and there had his attention attracted to a stick in the water, the small end of the stick being against the plug of the sluice and the large end against the dam. Thinking there was a line or net attached to it, for the purpose of taking fish, he pulled up the stick, and a child immediately floated to the surface of the water, on its back with its legs down.

The stick was about seven feet long. The water was seven feet deep. There was no road nor pathway near that pool. The Surgeon who made a post mortem examination proved that the child was a perfectly healthy one, and that drowning was the cause of death.

There was no mark whatever of external injury or internal disease

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* Southwood Smith on Evidence ; Medical Gazette, 1837-38, Vol. 1. p. 311:

† Evening Mail, August 4, 1851.

He was of opinion that the child never rose to the surface after it was first put in till it died; for if it had risen it would have swallowed some water, and none was found in the stomach. When Mary Rogers was arrested next morning, and told the charge against her, she made no answer but cried. Here we have the following facts or circumstances bearing against the prisoner.

1st. The child was illegitimate and, therefore, less likely to be cared for by the prisoner than if it had been born in wedlock, 2nd. It was last seen alive in her charge. 3rd. She was seen to proceed in the direction of the pool with the child. 4th. She was seen after her return from that direction without the child. 5th. Her statement that she had left the child at the house of Mr. Rogers was false. 6th. It was clear from the farmer's evidence that there was no path close to the pool and so there could not be any reason for the child being taken in that direction except the desire to drown it. 7th. It was clear from the same evidence that the child could not have been drowned accidentally as the stick could have been placed as it was only by some one determined to keep the child at the bottom of the water. 8th. The medical evidence made it more than probable that the child had not fallen in accidentally as, in that case it would have floated some little time, but had been thrust at once to the bottom of the pond. 9th. Not a line of evidence was brought forward to prove that any one but the prisoner might possibly have done the deed. 10th. The prisoner did not deny the charge when apprehended, but in a manner acknowledged the truth of the accusation by remaining silent and bursting into tears. Here there was not a particle of direct evidence. The evidence is circumstantial, but made up of a train or succession of circumstances so accurately coincident, that there could be but one presumption in the minds of the jury, a presumption almost equal in probative force to proof positive that the prisoner, and no one but the prisoner had drowned the child.

It is almost needless to add that the prisoner was sentenced to be executed.

To show you how facts which are not of the slightest probative force when regarded singly may constitute an overwhelming chain of circumstantial evidence when received together, I shall quote the following instructive case from Dr. Southwood Smith's lecture on Forensic Medicine.*

"On March 30th, 1781, at the assizes at Wawrick, Captain Donellan was convicted of murder, committed by poisoning Sir Theodosius Boughton. This case may be taken as an example of an aggregate body of circumstantial evidence, approaching, perhaps, as nearly to completeness as the nature of circumstantial evidence admits; while the individual facts taken separately can be scarcely said to prove anything.

"In right of his wife, Capt. Donellan had an interest in the estates of Sir Theodosius Boughton. He formed the determination to take away, by some means or other, the life of this young man. To shut the door

* Medical Gazette, Vol. 1, 1847, p. 406.

against suspicion, he began by propagating the notion that the state of the young man's health was desperate; that his death would certainly take place at no distant period; that imprudence was continually heaping up causes upon causes. All this time he was only labouring under a trifling complaint, and was guilty of no imprudence manifest to any one about him. The poison fixed upon by the murderer was distilled laurel water. It was in his statement, relative to the effects of this poison on the human body, that Mr. John Hunter appeared to such disadvantage as a medical witness. To avoid the suspicious circumstance of the purchase of poison, Donellan provided himself with a still, for the fabrication of it. He practised distillation frequently. The room in which he operated he kept locked up. The poison was now prepared; how was it to be administered? The young man was taking medicine for a slight complaint under which he was suffering. The phials, as they came in, were usually placed by the invalid in an inner room, which he had been in the habit of locking up. He happened once to forget to take his medicine. "Why," says Donellan, "don't you set it in your outer room, you would not then be so apt to forget it?" The fatal advice was followed. Soon afterwards a draught taken from the shelf of the outer room, marked "purging draught for Sir Theodosius Boughton" was given to him by his mother, Lady Boughton. She observed to her son, at the time she gave him the draught, that it smelt very strongly of bitter almonds. In two minutes after taking the contents of this phial, the young man was seized with violent symptoms, and in a few minutes more he expired.

"Now in all this there is no direct evidence attaching guilt to Donellan, and if the evidentiary facts are examined singly, how feeble are they; if viewed in the aggregate, how conclusive!

"Donellan practised distillation, as a proof of poisoning, to what did that amount? next to nothing. At that rate all the distillers would be poisoners."

"Not engaged in distillation, not engaged in any other occupation, with a view to profit, not engaged in chemistry in other shape, still he practised distillation. To what did that amount? something more, perhaps, but still very little more. At that rate all the Lady Bountifuls in the country would be poisoners.

"He distilled what there was reason to think was laurel water, a known poison, a substance not known to be used for any other purpose; the proof strengthens, but still it is very far from conclusive.

"Thus much as to preparations, though there were others, which I pass over. Go on next to motives. The relation of the defendant to the deceased was such that, upon the death of the latter, a large property was to devolve upon the former. Does it follow that, at the expense of so horrible a crime, he endeavoured to occasion such death? At that rate the most common of all causes of death would be parricide.

"Now observe how the addition of another circumstance, how the addition of another link in the chain, affects all the preceding. In less than five minutes after the fatal draught had been swallowed by the young baronet, Donellan came into the bed chamber where the dying youth lay. On the trial, Lady Boughton deposed as follows:—

"On coming into the room, Captain Donellan asked me 'in what manner was Sir Theodosius taken.' I told him. Then he asked me, where the physic bottle was?' I showed him the two draughts. He took up one of the bottles, and said? 'Is this it?' 'Yes,' said I. Then he took it up, poured some water out of the water-bottle, which was just by, into the phial, shook it, and then emptied it out into some dirty water, which was in a wash-hand basin. Observing this, I said—What are you about? You should not meddle with that bottle? Upon that he snatched up the other bottle, poured water into it, and tasted it. I said, 'what are you about? You ought not to meddle with those bottles?' Upon which he said, 'Oh! I did it to taste it?' The first bottle, however, he did not taste?

"Now the circumstance that laurel water was contained in either of these phials was a most material fact; it was a piece of real evidence of the greatest importance. Even the smell of laurel water in either of the phials was an evidentiary fact of the greatest moment. Donellan knew that the smell of laurel water had been recognised in the draught taken by the deceased; he saw that observation was directed to the remaining phials; conscious apparently of the importance of destroying this object of real evidence, he emptied the bottles of their contents, and washed them out.

"I add two other links to the chain, of scarcely any strength when considered by themselves, but of considerable strength when connected with the preceding:—

"In about a quarter of an hour after leaving the bed chamber of the deceased, Captain Donellan met the maid servant in the passage. He said to her, 'Sir Theodosius was out very late over night a fishing; it was very silly of him since he had been taking such physic.' And some days afterwards he brought to this maid servant a still which she deposed had been well washed, and which he desired her to put into the oven to dry it, that it might not rust; 'but I said if I put it in, then it would unsolder it, as it was made of tin.'

"Observe, now, how the probative force strengthens with the addition of every link to this instructive chain of evidence! How the subsequent facts shed light upon, and add importance, to the anterior events.

"The forewarning that the young man was to die; the distillation of one of the most potent poisons then known; the opportunity sought and procured of administering this poison; the recognition of this identical poison by its smell when the draught was given by the mother to her son as a purging draught; the death of the young man in a few minutes after taking this draught; death attended with all the symptoms which this poison is known to produce; the conduct of the suspected murderer in the bed chamber; his anxiety to destroy the evidence of the existence, of the poison in question, by throwing away the remaining portion of it, and destroying even its smell; his attempt to assign a false cause for the death of the deceased; his subsequent cleaning of the still; his wish to get it placed in a heated oven, that no suspicious smell might by possibility remain attached to it; and, lastly, the large property that would come into his possession on the death of

the deceased. Take any of these circumstances by itself, how inconclusive! take each in connexion with the rest, and view the whole combined, forming together an aggregate body of evidence, how conclusive!

"Such, then, is a chain of circumstantial evidence composed of a number of independent but closely connected facts, all occurring to produce in the mind a persuasion of the existence of some other facts.

After the execution of Donellan, a volume of the Philosophical Transactions was found in the Library to which he had daily access with a leaf turned down at an article on the preparation of prussic acid. Laurels grew in the house garden.

The best summary of the rules regarding evidence which I have been able to meet with, is that contained in the preface to Arbuthnot's Select Reports of Criminal Cases determined in the Court of Foujdaree Udalut of Madras, and I shall not offer any apology for extracting rather largely from it, as I am certain Mr. Arbuthnot will be well pleased to see the summary turned to account in the spread of useful information. The summary abounds in well selected illustrations, such as I could not readily obtain while occupied with the compilation of the more strictly medical parts of this our first course on medical jurisprudence, and I would therefore advise those of you who can afford it, to obtain the work itself for further study and reference. I shall quote only four of his rules with a few of the remarks upon them. The third and sixth rules may be left till you consult the work itself.

"Rule I. The onus of proving every thing essential to the establishment of the charge against the accused lies on the prosecutor.

"This rule is derived from the maxim of law that every person must be presumed innocent, until proved to be guilty, and does not appear to require notice or illustration, being invariably acted upon and understood.

"Rule II. There must be clear and unequivocal proof of the corpus delicti.

"Every criminal charge involves two things; first, that an offence has been committed; and, secondly, that the accused is the author of it.

"Mr. Starkie states it to be an established rule, that, upon charges of homicide, the accused shall not be convicted unless the death be distinctly proved, *either by direct evidence of the fact or by inspection of the body*. With reference to the general principle thus laid down, Mr. Best remarks, that in some offences the evidence establishing the existence of the crime also indicates the criminal; while in others the traces or effects of the crime are visible, leaving the author of it undetermined.

"In most cases, however, the proof of the crime is separable from that of the criminal; and in these the corpus delicti is made up of two things: first, certain facts forming its basis; and, secondly, the existence of criminal agency as the cause of them. With reference to the former of these, it is the established rule that the facts which form the basis of the corpus delicti ought to be proved, either by direct testimony, or by presumptive evidence of the most cogent and irresistible kind. In cases of murder the fact of the death should be shown, either by witnesses who were present when the murderous act was done, or by proof of the body having been seen dead; or, if found in a state of

decomposition, or reduced to a skeleton, it should be identified by dress or circumstances. In proof of the sound policy of this rule, Mr. Best quotes the following case, which has been often cited. "An uncle had the bringing up of his niece, a girl about eight or nine years old, to whom he was heir at law, and happening to correct her for some offence, she was overheard by some of the neighbours to cry out, "Oh, good uncle, kill me not!" after which, she disappeared, and was not to be found. The uncle was taken up on suspicion of murder, and admonished by the Judge of Assize to produce the child at the next Assize. This he could not do: but, in order to avert suspicion, dressed up another child, about her age and resembling her in person, whom he presented to the Justices as his niece. The deception was, however, detected, and he was convicted and executed for her murder. The girl, who had only run away to avoid being beaten, returned afterwards and claimed her property.

"When, however, the fact of murder can be proved by eye-witnesses, the inspection of the body after death may be dispensed with.

"The basis of the corpus delicti being once established, presumptive evidence is receivable to complete the proof by rebutting the hypothesis of natural causes and irresponsible agency have produced the facts proved. For this purpose all the circumstances of the case should be taken into consideration. On finding a dead body, for instance, it shoud be considered whether death may not have been produced from natural causes, or been the result of suicide; and on this latter subject the following directions given by Dr. Beck to the members of his own profession are quoted by Mr. Best. "Besides noticing the surface of the body, we should pay particular attention to the following circumstances; the situation in which it is found, the position of its members, and the state of its dress; the expression of countenance, the marks of violence if any be present; the redness or suffusion of the face; the last is important, as it may indicate violence in order to stop the cries of the individual; the quantity of blood on the grouud, or on the clothes, should be noticed, and, in particular, the probable weapon used, the nature of the wound, and its depth and direction. In a case of supposed homicide by means of a knife or pistol, the course of the wound should be examined, whether it be upwards or downward, and the length of the arm should be compared with the direction of the injury. Ascertain whether the right or left arm has been used, and, as the former is most commonly employed, the direction should correspond with it and be from right to left." It is of the utmost importance to examine minutely for the traces of another person at the scene of death, as experience shows that murderers have often disposed of the bodies of their victims in such a manner, as to lead to the supposition of suicide, or death from natural causes.

"Rule IV. The hypothesis of delinquency should flow naturally from the facts proved, and be consistent with them all.

"Mr. Best remarks that the chief danger to be avoided, when dealing with presumptive evidence, arises from a proneness natural to the human mind to jump at conclusions from facts, without duly adverting to others, inconsistent with the hypothesis which those facts seems to indi-

cate. "The human mind," says Lord Bacon, "has this property, that it readily supposes a greater order and conformity in things than it finds; and although many things in nature are singular and dissimilar, yet the mind is still imagining parallel correspondences and relations betwixt them which have no existence." And, it has been observed by Mr. Starkie, that "all facts and circumstances, which have really happened, were perfectly consistent with each other, for they did actually so consist." It is, therefore, a necessary consequence that, if any of the circumstances established in evidence be absolutely inconsistent with the guilt of the accused, that hypothesis cannot be true; nor should it be admitted as amounting to proof, if there be contrary hypothesis and facts, which, though insufficient to exclude the supposition of guilt, and strongly to disprobalize it. Mr. Best quotes a case in which the latter rule was violated; a young woman having been convicted and executed for attempting to poison a family, with whom she lived as cook, by putting arsenic into some food. It was proved that she had herself partaken of, and suffered severely from, the poisoned food; but of these important circumstances no notice was taken in the Recorder's charge, and it appears that another person has since confessed the crime.

"RULE V. Presumptive evidence ought never to be relied on when direct testimony is withheld.

"This rule is a branch of the general principle, that the wilfully withholding important evidence raises a presumption against the party, and throws discredit on the evidence which he offers."

PART THIRD.

REMARKS BY THE EDITORS.

Since the last number of our Journal was published, we have received considerable additions to the list of Subscribers, and although we might now say, that we are proof against failure arising from want of funds, yet, we regret that we have still to complain somewhat of a deficiency of literary contributions.

We feel grateful for the pecuniary assistance we have so liberally received, which is a strong proof that our professional brethren appreciate our exertions on their behalf. The aid thus given speaks much in their favour. We must, however, again bring prominently before them the necessity of early supplying us with literary contributions, compared with which the pecuniary assistance which they have so kindly given us, as far as their own prospects at least are concerned, is of secondary importance.

By maintaining with spirit and energy the character of our Journal, the members of the subordinate departments cannot fail to be raised in the estimation of Government, and of the public in general. When our brethren can show by their exertions and perseverance, that they are a highly deserving and useful class of public servants, and that their abilities are such as to deserve every confidence, then they may with every hope of success look forward to a time when better prospects will be opened up to them.

The time we hope is fast approaching when every department will be rewarded according to its merits, and it therefore becomes us to lose no time in exerting ourselves to the best of our abilities, so that we may have recorded facts to show that we are in every respect worthy of the encouragement of Government. It is a healthier state of matters when an individual, or a body of individuals, can come forward with claims to preferment grounded on his or their own usefulness and acquirements, than when he, or they depend on the interest of partial and favoring friends. Let us then persevere with energy in the course set before us, and if we desire to better our condition, let us first show that we adopt every means for improving ourselves, that we have the knowledge, and that we only require opportunity to prove we can apply that knowledge well in independent charges to the advantage of our patients and to the satisfaction of our superiors. If we have Medical experience, and are not ashamed of the poverty of our professional acquirements, we are bound to come forward in this Journal, that we may show by our contributions what use our opportunities have been to us, and how far we have kept pace with those who in some respects have been more advantageously situated than ourselves.

We are now in a fair way of improving our condition and prospects, let us make the best of the present opportunity and prove faithful to our own cause.

We are glad to see that within the last year or two, considerable improvement has manifested itself amongst our professional brethren, and we trace the cause of this principally to the desire invariably evinced by two gentlemen high in office to improve the standard of qualification of the Subordinate Medical depart-

ment. It is also pleasing to observe that our brethren only require some such incentives to induce them to exert themselves.

We are borne out in this assertion, by the fact that some twenty or thirty Essays have been received in competition for the medal and other prizes so liberally offered by Government. Many more no doubt would have entered the field of competition were it not that the conditions, upon which the honorary reward of the medal can be permanently secured, deter many from entering as competitors. We, however hope, that ere long these conditions will be modified.

We conclude these remarks in full expectation of receiving numerous favours in the shape of Literary Contributions from our brethren. We shall be most happy to receive communications in the shape of correspondence on medical subjects. Interesting cases of disease treated in any of the regimental or station hospitals, or in private practice. Such cases would prove more acceptable if accompanied with remarks. Brief accounts of new remedies, or of new methods of treatment, would also prove interesting contributions to our Journal.

By the following extract from the Bengal *Hurkaru* of the 30th December last, our readers will observe that a weekly Medical Journal under the title of the "*Probe*" has been started by the students of the Bengal Medical College. We feel gratified that the Madras Medical Subordinates, have in this respect taken the lead. We hail our brethren of the "*Probe*" as fellow-workmen in our honorable profession, and we shall be most happy to exchange favours as far as our Journal and sympathies at least are concerned :

"We were horrified yesterday by the sudden appearance of a most ghastly-looking print, being No. 1, Vol. 1, of the *Probe*, a weekly publication, issuing from the Medical College, Calcutta. It is surmounted by a death's head, a pair of cross bones, and two skeleton hands, drawn with characteristic but fearful fidelity. It bears as its motto, in large capitals, the word *Perge*. We were disposed to suggest a slight error in the orthography, and the substitution of an U for the first E, till a friend persuaded us to believe that the word was the Latin for "Go a-head," and had some mysterious reference to the *caput mortuum* above it. The publication is a small folio of four pages superseding, it appears a manuscript paper which has lately been circulated among the *attachés* of the College. The editor in his first leader says :—

"The Medical College of Calcutta needed a Journal, and this want was at first felt by a fellow student of ours who once a week issued a MS. copy for

the perusal of a limited number, it was afterwards handed to another, who followed that laudable example, but on leaving these shores for the West Indies, it fell to our lot, and we by the conjoined effort of those taking interest in the welfare of this noble institution, deemed it advisable to make it appear under its present form."

* * * * * * * *

The Annual Examination of the Medical Subordinates at the Presidency, we are glad to say, terminated, on the whole, very satisfactorily. Of the large number examined, only two or three have, we understand, been found fault with. The system of annual examinations lately introduced, tends considerably to improve the professional acquirements of the members of our department; and those at the Presidency have many opportunities of obtaining information which their less fortunate brethren in the Mofussil have not. The lectures daily delivered at the Medical College are open to such as desire to avail themselves of this means of gaining information, and they may, moreover, should they so desire it, become Members of a Society called the "*Madras Apothecaries' Society*," which meets weekly at the Medical College to discuss subjects brought before the Meeting by the members. The morbid and other preparations, books, plates, &c. &c., belonging to the Medical College may be used by the Members of this Society for illustrating any of the subjects under discussion. This indulgence we owe to the College Council, and to the Medical Board. In our next we shall give further particulars regarding this Society, and perhaps publish some of its Rules.

Probably it is not generally known to many of our readers that, an excellent substitute for the expensive cod-liver oil is found in the oil obtained from the liver of the skate, a fish very common in the bay of Bengal and called by the natives of Madras *Thirka Meen*. It is a large, broad, flat fish, with a whip-like tail. The oil can always be procured from the natives in large quantities at the rate of 10 or 12 annas a quart; in this state it is thick and impure, containing about 20 or 30 per cent. of stearine. We have purified the oil by gently boiling it with a small quantity of water; after cooling we keep the vessel in a cold bath, or wrap it over with wet cloths, the stearine settles to the bottom, and the fluid oil is then decanted and filtered through flannel. In this state

it is clear, of a not unpleasant fishy smell, approaching in color to the best cod-liver oil, and in no way differing from it either in its physical, chemical, or medical properties. The cost of a quart of the clarified oil varies from 1 to 1½ rupee. We speak of the properties and medicinal qualities of the skate liver oil from experience, having prepared, and used it in practice with the best success.

PART FOURTH.

SELECTIONS.

LECTURES ON HISTOLOGY,

DELIVERED AT THE

ROYAL COLLEGE OF SURGEONS, LONDON.

By J. T. QUEKETT, Esq.,

Assistant-Conservator of the Hunterian Museum.

(Continued from page 106.)

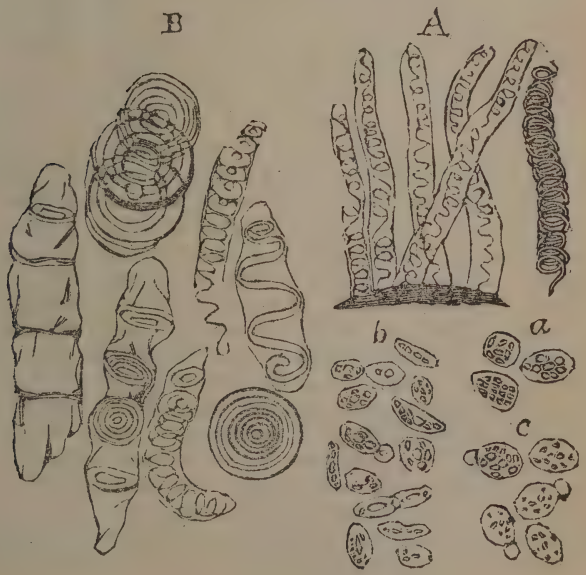
FIBRE.

Fibre, although at one time regarded as an element of vegetable tissues, is now generally looked upon as a secondary formation deposited within the walls of cells, or, in other words, on the internal surface of membrane. It is solid, sometimes transparent, and generally speaking of a greenish white colour, though in some few plants, as in the elaters of *Jungermannia*, it is more or less red. Its direction, as shown in *Fig.* 5, A B, is most frequently spiral, the spires running from right to left; in some plants, however, the direction is from left to right. According to Lindley, it is straight in the lining of the anther of *Campanula* and *Digitalis purpurea*. Fibre varies considerably in size; in some plants it exceeds 1-3000th of an inch in diameter, in others, it surpasses in delicacy the finest hair; it generally adheres very firmly to the sides of the cell-wall, especially in the young state, when the turns of the spiral are very close together, but as the cell elongates, the fibre sometimes keeps pace with it, and the turns are more widely separated. Two or more contiguous turns are very prone to anastomose, and it is in this way that all the peculiar markings found in cells are formed, such as the rings, dots, and reticulations hereafter to be described. When the spiral cells are fully developed, as shown in *Fig.* 4, E, the fibre will separate from the membrane of the cell-wall, and its elasticity is such, that it ever tends to unroll itself, and in old elongated cells or vessels, it frequently ruptures the membrane, and becomes more or less straight. In this way the fibre may be obtained in an isolated condition.

The bulbs of many of the lily tribe, as in this specimen of squill from the Mediterranean, contain spiral vessels in such abundance, that the entire series of laminæ of which they consist, would seem to be composed of spiral fibres. These are obtained in such numbers in some bulbs, that they are collected, bound into bundles, and used as a kind of slow match for lighting pipes and cigars. The elasticity of spiral fibre is very beautifully shown by removing a minute portion of the testa of the seeds of many plants, as the *Collomia grandiflora*, purple-topped Clary, &c. When this is moistened in water, cells that were so closely adherent together as not to be distinguished, become soft, the spiral fibre, being thus released, as it were, from its close captivity, uncoils itself and pushes the cell-wall before it, and what was at first a brown shapeless object, becomes a mass of beautiful spiral cells. A few of the cells from the *Collomia* are represented in *Fig.* 5, A.

Fibre, like membrane, is frequently increased in thickness by continuous deposits, so that the spiral thread may become a flattened band or even a ring, like a quoit, as shown in *Fig.* 5, B, from a *Cactus*, in which may be seen cells with fibres in various stages of development; some of them exhibit thickened fibres; others have the fibre converted into a flattened band; whilst in others may be seen the ring-shaped bodies, in which are evidences of concentric deposit.

Fig. 5.



Having now directed your attention to the principal points of interest connected with membrane and fibre, I shall proceed to speak of the disposition of the former in all the varieties of plants. In my first demonstration, I stated that the most simple plants are composed of cells or utricles, and that all others, however complicated in structure, are made up of a series of such cells, variously modified by pressure, and arranged according to the conditions under which they are developed and the functions they have to perform. Within the transparent membrane of which the young cell alone consists, there is in the growing cell a thin delicate lining, termed the primordial utricle of Mohl; within this is a nucleus or cytoblast, and this again contains smaller cells or nucleoli. The typical form of cell is either spherical or oval; but by pressure in growth they assume almost every variety of shape, and their walls become thickened either uniformly or partially. In the most lowly organized plants, as in some of the Algæ and Fungi, the cells maintain their original form throughout life; but in the majority of instances, as has been already stated, they undergo much alteration in shape. The following are the chief forms found in different plants, which have been specially named by botanists; the oblong, lobed, square, prismatic, cylindrical, fusiform, muriform, sinuous, stellate, filamentous, &c.

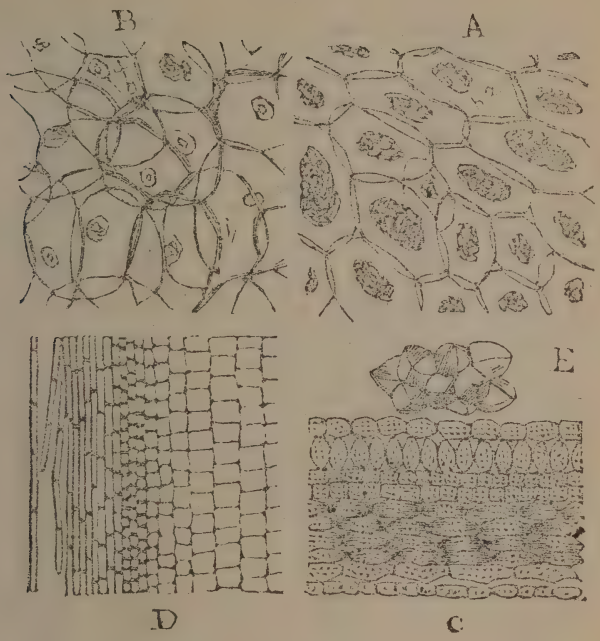
In pulpy fruits, such as the strawberry when ripe, the cells may be readily separated from each other, and obtained in an isolated condition; and many of them, as in the lemon, will be found to be upwards of half an inch in length; in the shaddock they are much larger; but in many other fruits and parts of plants, the agency of maceration or of boiling water must be resorted to for their separation.

I will now exhibit a few examples of the typical form of cells; and perhaps one of the most striking, and at the same time most interesting to us as medical men, is the *Torula cerevisiæ*, or yeast-plant, shown in *Fig* 5, *a. c.* It consists of a series of nucleated cells of an oval figure, some of which have a smaller cell adherent to one extremity: by some persons, these are regarded as spores; by others, as distinct plants; they are always found in fermented liquors, the process of fermentation, according to most authorities, being nothing more than a rapid generation and growth of these plants. Another species of *Torula* is found in the urine of diabetic patients as soon as fermentation commences; hence it has been named *T. diabetica.* I am sorry, however, that I cannot show you a specimen at this time, but an opportunity of doing so, I have no doubt, will occur before long. For the sake of comparison with those of *T. cerevisiæ*, a few of these cells are represented in *Fig.* 5, *b*; they are much smaller, and more oval in shape, and are beginning to be arranged in a linear series. This is always found to be the case, both in new beer and in urine, if kept for some few days; and this has led botanists to suppose that the single cells are only the spores, and that the true plant, in both instances, consists of branched moniliform filaments.

In this specimen *Fig.* 6, A, from the ripe *strawberry*, you have an example of larger cells of an oval figure, some of which contain a brownish nucleus *a*, *b*; and in this, from the flowering stem of the

Leek, represented in *Fig.* 6, B, the nucleus *a*, and nucleolus *b*, are plainly seen, although the cells cannot be so readily separated from each other.

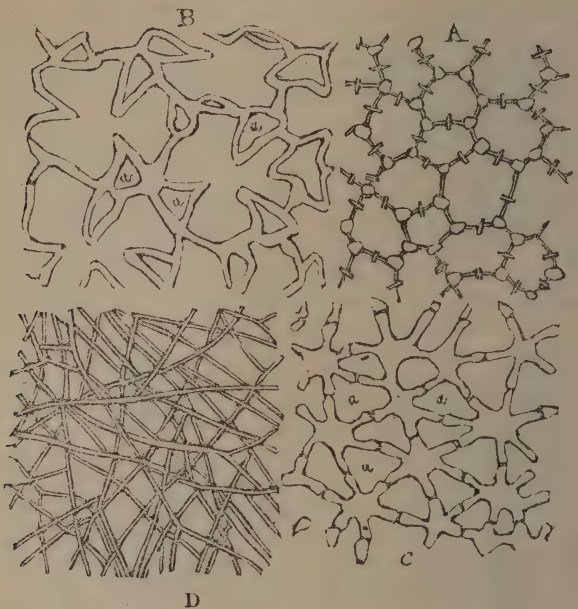
Fig. 6.



It would, I fear, occupy too much time to exhibit to you each of the varieties enumerated above ; but, in this section of the leaf of a *Balsam*, *Fig.* 6, C, and in the mass of the cells E, most of the forms may be distinguished, more especially the square, the oblong, and the lobed ; and in this specimen, from the *Gourd*, represented by *Fig.* 6, D, you will notice, that cells more or less cubical may become prismatic, or even be so much compressed towards one edge as to assume the appearance of fibres. There are, however, some of the varieties which demand a more particular description. Of these, the first is the *stellate* form ; in the stems of many water-plants, such as rushes, and especially the petiole of the sweet burr-reed, *(Sparganium ramosum,)* when young, there are strata of hexagonal cells which form septa ; these, as shown in *Fig.* 7, A, have around their margins certain notches, which, with those in adjacent cells, form triangular apertures, known to botanists as *lacunæ* ; in process of growth these notches become deeper and deeper, the lacunæ, *aa*, enlarging at the expense of the area of the cell-wall, which gradually assumes more and more the appearance of a star, as shown in *Fig.* 7 B. In the rush we have a very beautiful example of this form of tissue, the cell being reduced to a six-rayed star, as shown in *Fig.* 7, C, but the remains of the cell-wall,

as indicated by the black lines, *aa*, are always present. By this alteration in the shape of the cells, the stem becomes light, and large receptacles for air, common in most water plants, are thereby formed.

Fig. 7.



Very striking specimens of the filamentous form of tissue are obtained from many of the fungi, as the common edible *Mushroom*, in which the cells are of a long oval figure, and joined end to end ; but in a large *Boletus* they are so greatly compressed and elongated as completely to assume the appearance of fibres, and many of them, as shown in *Fig.* 7, D, will be seen to bifurcate ; but still a transverse line, indicating the cell-wall, is occasionally visible.

Another variety of cell arrangement is known as the muriform, from its resemblance to that of bricks in a wall ; it is found in the medullary rays of certain woods, and gives to them the peculiar appearance known as the silver grain ; such cells are readily seen in the coniferæ, and in this specimen from the common yew.

Other forms, especially the sinuous, occur in the cuticle of most plants ; the cylindrical, however, is best seen in the *Characeæ*, and you will have an opportunity of viewing it at a subsequent period, when I come to speak of green colouring matter or chlorophylle, and the phenomenon of cyclosis.

Dismissing now the subject of the form and structure of cells, we will proceed to consider, in the next place, the nature of their contents ; these are colouring matter, starch, oil, raphides, silica, &c. I have already stated, that the beautiful variety of colours seen in the

corollæ of flowers is dependent not upon the membrane composing the cells, but upon colouring matters, mostly of a fluid nature, contained within them ; and I, at the same time, illustrated this, by exhibiting a portion of the cuticle of the garden rhubarb, in which you saw cells full of a red colouring fluid occurring singly amongst others more or less green or white. I now show you a portion of the corollæ of a geranium, most of the cells of which are full of crimson fluid, which imparts to this favourite flower its rich hue. In the case of the ferns before alluded to, the brown colour was dependent on that of the cell-wall and not on its contents. In old cells of palms and certain coniferæ, resinous matter of rich colour is often met with ; this, however, is solid, and is very remarkable in the palm yielding the material known as dragon's blood. The green colour, so universally present in plants, is due to a more or less solid material, contained in cells and termed chlorophylle, or green vegetable wax ; it consists of minute spherical or oval particles, but as these have certain properties in common with starch, they will be more particularly described with that substance.

Starch, which performs a similar office in the economy of plants to that of fat in animals, is a most important ingredient in the aliment of the whole human race, and two-thirds of mankind subsist almost exclusively upon it ; its existence was known to the ancients. Leeuwenhoek first examined it microscopically in wheat and beans, and as you may see has given tolerably accurate representations of the granules in the second volume of his works. Starch is found in the cells of plants in the form of granules, as seen in *Fig.* 8, *g*, from the rhubarb, the cells of which have been separated by maceration ; also in this section of a potato. It is usually obtained by rupturing the cell-walls and washing out their contents with cold water ; when dry it is hard, and if rubbed between the fingers a peculiar crackling sound is produced. Starch is capable of being diffused through cold water, but is easily soluble (diffusible) in boiling water, acids, and alkalies ; in this section of boiled potato the starch has disappeared ; in alcohol, ether, volatile, or fixed oils, however, it is quite insoluble. When examined microscopically it is found to consist of more or less oval granules of various sizes, having definite and peculiar characters in different plants ; thus in the *Tous les mois*. *Fig.* 8, *e*, they are of very large size ; in the potato, *Fig.* 8, *d*, they are much smaller ; and in the rice, *Fig.* 8, *c*, are so very minute as to require a power of 250 diameters to discover them.

Each granule has at one extremity a circular spot, termed *hilum*, around which are a large number of curved lines, passing at first in circles concentrically around the hilum, and subsequently in curves ; these markings are not, as has been imagined, the result of consecutive deposits, nor indications of increments of growth of the granule itself, but they are confined to the cell-wall, and are most probably mere transverse puckerings or rugæ in the membrane, of which, together with its amylaceous contents, the starch granule consists. If sulphuric acid be added, and heat be gradually applied to starch, the granules swell to three or four times their ordinary size, and the distended cell-walls lose all trace of the markings which previously existed. When starch is boiled in water the cell membrane swells and bursts ; the first

Fig. 8.

stage of which is shown in *Fig.* 8, *f.* and the amylaceous matter becomes intimately mixed or dissolved in the fluid.

The presence of starch, in however minute quantities, can be immediately recognized by the addition of free iodine, which forms with it the iodide of starch, a compound of a beautiful blue colour ;—this test was discovered by Jurine. A little tincture of iodine added to the grains of starch in this section of a potato will make each granule blue, but will not so colour the vegetable cells in which these granules are stored up. If I boil a small quantity of starch and poured into a vessel of cold water, the addition of a few drops of tinct. iodine will give the water a rich blue colour ; if a little of this water be examined under the microscope, the colour will be seen only in the remains of the granule-membrane ; and if the water be allowed to stand, all the colouring matter will be found at the bottom of the vessel as a precipitate, showing that all parts of the starch grain are of greater specific gravity than water.

I have stated that the starch grains have definite and peculiar characters in different plants ; and as starch, under certain names, such as *Tous les mois*, tapioca, sago, arrowroot, &c., is largely used by invalids and children, it becomes of importance for us, as medical men, to be able to detect frauds which are frequently practised in these articles. In *Fig.* 8, *a*, *b*, *c*, *d*, *e*, &c., you have representations of the principal varieties of starch, all of which are drawn to a fixed scale, and they

therefore bear their proper shape and proportions; and it will be readily seen that by means of the microscope, any mixture of two or more of them, or of other varieties with them could be easily detected. This was strikingly exemplified, some years since, in a case which our celebrated chemist, Dr. Ure, was employed to investigate. This was an attempt to import the starch of the Cassava, which bears a duty, as arrowroot, upon which there is no duty; by which means the revenue would have been defrauded to some considerable amount. The difference between the two starches was not sufficiently obvious to the naked eye; but my means of the microscope, and a knowledge of the nature of the grains, the Doctor was enabled to detect the imposition.

Could it be proved that a direct relation exists between the size of the starch granules and their nutritive quality, we should, of course, possess a ready method of determining such quality in any given specimen; and, on this principle, *Tous les mois* must be considered as much more nutritious than the potato, and the potato than the rice starch.

Starch, moreover, possesses the property of polarizing light; and in this specimen of *Tous les mois* you will see in each grain a black cross surrounded by colouring rings, and, if the analysing prism be revolved, a white cross, with complemental colours of less intensity, may be noticed.—*Medical Times.*

(To be continued.)

ON THE PHYSICAL DIAGNOSIS OF DISEASES OF THE ABDOMEN.

By Edward Ballard, M. D.

Late Physician to the St. Pancras Royal General Dispensary, &c.

[*Continued from page* 117.]

Mensuration.—*Mode of measuring—results of measurement in health—while at rest—measurement of extent of movements—measurement in disease.*

Palpation.—*Mode of palpation—results of palpation in health—Physical signs derived from palpation in disease—Examination by the vagina—Examination by the rectum—by the uterine sound.*

Measurement renders accurate the results of simple inspection, and, like it, may be applied to the chest and abdomen, either to ascertain their dimensions when at rest, or to determine the extent of their movements.

Mode of Measuring.

The precautions to be observed as to the patient are the same as for inspection. The most convenient instrument for ordinary use is an inelastic tape, marked with eighths of an inch, but for certain purposes the "chest measure" of Dr. Sibson* will be found indispensable. In

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* Med. Chir. Trans. vol. xxxi. p. 535.

making comparative daily measurements, great care should be taken that the posture of the patient be as nearly as possible the same, and that the tape or chest measurer be applied over the same parts of the surface. For the latter, the eye and memory will scarcely suffice, and it is consequently advisable to stain the spot or line of the first day's measurement with the nitrate of silver or iodine. Measurement may be either *circular*, for the determination of the girth of the trunk at different parts, and the relative size of the two sides, or it may be applied to discover the distance between certain fixed points; as the lower end of the sternum, the pubic symphysis, the anterior spinous processes of the iliac bones or the umbilicus. In making circular measurement, the patient should hold his breath at the end of an ordinary expiration; the commencement of the measuring tape should be placed exactly at the middle line anteriorly, and from this point it should be carried evenly and horizontally round the trunk, passing over the right side first, till it arrives again at the middle line anteriorly. To compare the two sides of the trunk, that of the right may be ascertained by noting the spot at which the tape crosses the middle line behind, and that of the left by subtracting the size of the right side from the entire girth. For this purpose, however, the patient must either sit or stand, and two persons must be engaged in the measurement; one to arrange the extremities of the tape in front, and the other to observe where it crosses the spine behind. When a patient is in bed, and cannot sit up or stand for the measurement to be made, this method cannot be employed. Two tapes may then be joined together at their commencement and at this spot, where they are to be applied to the spine they may be adapted to it either by padding, or by affixing to the junction a little bent plate of brass: by either plan the apposition of the commencement of the scale of each tape to the spinous processes is secured. Each tape being then brought round to the middle line in front, indicates the circumference of its own side.

The measurement of the extent of the respiratory movement of any part of the thoracic or abdominal wall can only be ascertained by the use of the "chest measure." It may be applied either in the recumbent, sitting, or standing posture, the flat plate being laid upon the back, and the rack and dial brought in contact with the spot whose amount of motion is to be tested.

To determine the general enlargement of each semi-circumference with the inspiratory act, a small addition has been made to the double tape above described, by Mr. H. Thompson. It consists in a piece of brass, with a spring fixed on the back part of it, and between these the tape of one side is allowed to slip during the inspiratory act, the apparatus being firmly held so as to correspond with the anterior median line, while the other tape is permitted to slide through the fingers; the expansion of both sides is then ascertained at once.

Results of Measurement in Health.

1. The horizontal lines at which it is most desirable to take the girth of the trunk are that which crosses the *nipples* on the fourth rib, that which commences and ends at the base of the ensiform cartilage, or *lower extremity of the sternum*,—that which crosses the *margin of the*

lower ribs,—and that which begins and ends at the *navel*. In cases where the abdomen is distended by disease, an additional line of measurement is made at its most prominent part. The girth of these several parts presents in health pretty constant relations; their absolute girth varies exceedingly. In the robust male, the measurement around the nipples is the largest, that around the lower extremity of the sternum about $1\frac{1}{2}$ inches to 2 inches less, that which embraces the abdomen at the lower margin of the ribs is about $4\frac{1}{2}$ inches less that the last, while one between the lower extremity of the sternum and the lower margin of the ribs will be intermediate according to the part of the liver bulge at which it is taken. The measurement at the navel is a little larger than that at the lower margin of the ribs. The comparative measurement of the two sides, when the stomach is not distended with food, gives generally the following results. Measuring over the nipples and bottom of the sternum, the right side is found to exceed the left in size by from $\frac{1}{4}$ inch to 1 inch, the greater difference being commonly found in those persons whose employment leads them to make the greatest use of the right arm. Half an inch may be considered the average at the bottom of the sternum, and something less across the nipples. Unless the liver descends low, the measurement of the two sides at the lower margin of the ribs will be equal, or nearly so, and, in the absence of disturbing causes, the same may be said of that across the navel. I have said that the circular measurement should be made with the arms lying parallel to the trunk, for when, as is often done, they are raised at right angles with it, several alterations take place both in the actual and relative measurements of the two sides.

The circular measurements are influenced by age, sex, and habits. In proportion to the youth of children, the greater is the similarity of size of the two sides, and the girth of the trunk at the lower margin of the ribs is greater, until, in the infant, it is larger than that corresponding with the bottom of the sternum. In females whose thoracic walls have been altered in form by pressure, the relation of the several girths of the trunk are altered also; the smallest girth is in these at the seat of constriction, commonly at what should be the bulge of the liver, and from this point it is found increasing downwards towards the margin of the ribs. Apart from this constriction, however, the girth of the chest appears naturally less in proportion to that of the abdomen than obtains in the other sex. In persons whose occupations are sedentary, the girth round the nipples is proportionally less than in the more active labourer, and that around the lower margin of the ribs and abdomen proportionally larger. The navel is nearer to the pubic symphysis than to the bottom of the sternum, the proportion of its distance from each being about that of $6\frac{1}{2}$ from the former, to 8 from the latter.

2. Dr. Sibson has found as the result of his researches upon this subject, that "in the healthy robust male, the *movement* of the sternum and of the thoracic and intermediate ribs, from the first to the seventh, is from ·02 to ·07 in. during an ordinary inspiration, and from ·5 or ·7 in. to 2 in., (the amount varying with the extreme breathing capacity) during a deep inspiration. The ordinary abdominal (diaphragmatic)

movement, is from ·25 to ·3 in. ; the extreme ·6 to 1·6 in. The ordinary lateral expansion of the diaphragmatic or lower ribs is greater, and the extreme expansion is usually less, than the respective ordinary and extreme expansion of the thoracic or upper ribs. The expansion of the second ribs is usually alike on both sides ; below, all the inspiratory movements, especially those over the heart, are usually somewhat less on the left side than on the right, both during ordinary and extreme inspiration." In females the use of stays restrains the abdominal, and exaggerates the thoracic movements. "In infants the thoracic movement is considerable, being from ·02 to ·12 in., while the abdominal is from ·06 to ·15 in."

Measurement in Disease.

The results of both static and dynamic measurement in disease afford valuable information as to the condition of internal parts. In estimating this value, however, it must be kept in mind, that, in the aged, the rigidity of the thoracic walls presents an impediment to the changes of measurement which disease would produce in younger subjects, and, on the other hand, that chronic enlargement beneath them may produce increase of measurement and bulging on inspection, which will remain after the cause of fulness has ceased to exist. This is not uncommonly noticed in the cartilages of the ribs overlying the stomach. The *signs of disease* which measurement affords, are, 1st, *changes both actual and relative of the several girths of the trunk.* 2nd., *changes in the relative size of the two sides.* 3rd., *changes in the distance of the navel from the lower end of the sternum and pubic symphysis.* The *dynamic signs* derived from measurement have reference to *changes in the amount of movement of the several parts of the abdomen and chest,* during the respiratory acts. The Spirometer may be used to determine the extent to which the breathing capacity of the chest is reduced by abdominal as well as by thoracic disease. In using this instrument, however, it must be kept in mind that the results it furnishes are no evidence of absolute encroachment upon the thoracic cavity by abdominal organs, any more than they are of the absolute existence and nature of organic disease of the lungs, since the various affections of both cavities and their walls which lessen the thoracic expansion on account of pain, &c., necessarily influence its indications.

PALPATION.

By the application of the hand to the surface of the abdomen, we receive information not only respecting the abdominal wall, but also respecting all parts which can be felt through it. It informs us of position, size, form, weight, consistence, and elasticity, of spontaneous movement or mobility, and of the presence of any vibrations which may reach the surface. The clearness or obscurity with which internal parts may be felt through the wall, will depend in great measure on its thickness, all other things being favourable to the examination. Hence it occurs in disease, that parts at first not readily felt, or difficult of definition, become more evident as emaciation proceeds or serous infiltration disappears. The obscurity from the latter cause may sometimes be obviated by placing the patient in such a position for some

time previous to the examination, as will favour gravitation of the fluid away from the part.

Mode of Palpation.

It need scarcely be said, that for accurate palpation the hand should be applied directly to the surface. Care, however, should be taken that it is not cold, or the contraction of the muscles which its contact would occasion would interfere with the examination. The parts to which it may be applied are the soft wall of the abdomen, the space between the lower ribs, and the canals of the vagina or rectum. The position of the patient usually selected is the supine, but often it is advisable and even necessary to examine in the erect posture, or to change it in various ways, as from that on the back to either side, or to place the patient on the hands and knees. In determining the condition of the soft wall of the abdomen, the hand may be passed smoothly over its surface, by which means irregularities from new developments in it may become perceptible; but for deeper parts more or less pressure is requisite, which, according to the object we wish to arrive at, must be variously modified. In most cases, however, the abdominal muscles must be relaxed as far as possible, by raising the shoulders, and flexing the thighs upon the belly. This should not be left to be effected by the voluntary efforts of the patient, but both the body and the thighs should be placed in position by assistants, and retained so by the aid of pillows, &c. When this precaution has been neglected, the muscular portions of the abdominal wall have often been confounded with solid bodies within the cavity. Where parts are tender to the touch, palpation should be very gently performed, not only on account of the pain which it gives to the patient, but because the very act itself may be the means of injuring the continuity of tissue, and of producing such serious mischief as perforation of the peritoneum, or rupture of abscess, &c., into its cavity. For the same reason (the risk of mischief) it is well not to repeat this mode of examination unnecessarily. Occasionally the entire hand must be used, but mostly it is sufficient to employ the palmar surface of the last joint of the fingers, which should be first smoothly applied to the surface, and then depressed perpendicularly to it. The tips of the fingers are apt to give pain, but sometimes we cannot avoid using them.

Where there is great tenderness of the abdomen and mucous passages, Dr. Simpson recommends that the patient should be placed under the anæsthetic influence of chloroform previous to examination. I need scarcely observe how cautious we should be in following this practice, although no doubt there are cases in which it is the only means by which the full benefit of palpation and percussion for purposes of diagnosis can be obtained. Anæsthesia, however, we must recollect, may remove the only safeguard the patient possesses against injury from our manipulations, not only because it deprives us of all warning of our approaching tissues on the verge of disorganization, but also because it may tempt us to employ more roughness in our examination than we should do were the patient sensible of pain. In those cases where the tenderness arises chiefly or entirely from nervous causes, hysteria or spinal irritation, and the condition of the thoracic organs does not

interfere with its use, less evil is to be feared in this respect than where the tenderness is the pure result of local disease; in this latter case it appears to me doubtful whether it should be used at all. An objection to anæsthesia for the purpose of making a vaginal or rectal exploration, unless with the full consent of the patient after explanation, and in the presence of a friend, naturally occurs to the mind.

Result of Palpation in Health.

Many of the points which inspection displays in the natural or morbid conformation of the trunk are also capable of being ascertained by passing the hand over the surface; such as its general form and size, and the most remarkable of the elevations or bulgings which it presents. Palpation, then, becomes not only confirmatory of its indications, but, where the patient cannot or will not be exposed to inspection, may to some extent replace it. The wall of the abdomen readily yields to the pressure of the hand, but yet offers such amount of resistance as gives the idea of a certain thickness. It is elastic also, readily, and with a certain degree of force, following the hand as pressure is withdrawn. The resistance opposed to the hand is rather greater a little way below the xiphoid cartilage, in the angle of the epigastrium, than elsewhere, its extent varying with the extent of surface over which the *liver* is in contact with that part of the parietes. With this exception nothing can be felt of the liver, unless the fingers can be made to reach behind the margin of the ribs. In thin subjects with a lax abdominal wall this can sometimes be accomplished, the tips of the fingers coming in contact with the margin of the organ if sufficiently low. It is only under similar circumstances that the lower extremity of the *spleen* can occasionally be felt in health. The *kidneys* are, in consequence of their depth, and of the various organs which intervene between them and the antetior parietes, difficult to feel in their healthy state. The muscles of the abdomen must be efficiently relaxed, and strong pressure be made in their direction; the overlying intestines being pressed aside as much as practicable by a circular movement of the hands during the process of palpation, which may be assisted, if much difficulty is perceived in arriving at them, by counter-pressure from behind. Their anatomical position must be kept in memory, as it is not uncommon to see persons unskilled in searching for them groping with their hands at far too low a level. They are, if at all, to be discovered by the side of the vertebral column, on the level of the lowest ribs, and then it is only their lowest part that can be felt. In thin persons pressure to the left and a little above the umbilicus will often enable us to feel the pulsations of the aorta, especially where the lumbar curve of the vertebral column is great. The bodies of the vertebræ may be occasionally felt in such subjects. In females who have been much compressed with stays, the organs are often so greatly displaced, that the liver, spleen, and kidneys, can be felt without difficulty in the new position into which they have been forced.—*Medical Gazette, August* 1, 1851.

(To be continued.)

LECTURES ON DIGESTION, RESPIRATION, AND SECRETION,

GIVEN AT THE ROYAL INSTITUTION,

TO THE MEMBERS AND TO THE PUPILS OF ST. GEORGE'S HOSPITAL.

By H. BENCE JONES, M. D., F. R. S.,
Physician to St. George's Hospital.

LECTURE I.

ON THE FOOD OF PLANTS.

Gentlemen,—To prevent disappointment, I will commence these lectures on Animal Chemistry with a few words explanatory of the object which I wish to attain.

To you who are accustomed to this laboratory I cannot show new or striking experiments. I can hardly bring before you many preparations of substances which are not well known to you, whilst to those here present who are unaccustomed to chemical lectures, I cannot attempt now to give the elements of inorganic chemistry; for this, and this only is my object, to show you the application of your chemical knowledge to the explanation of the phenomena of digestion, respiration, and secretion, as far as it can at present be applied.

From want of knowledge, if from no other reason, I must fail in fully attaining the object I have in view; for, although in the last few years, Professor Liebig has given a new impulse to this part of science, and by his work on flesh has given us an example of what we may expect from the highest chemical knowledge; though M. Regnault has lately published the most accurate experiments on respiration; though M. Bernard, of Paris, and M. Frerichs, of Gottingen, are increasing the knowledge of the chemistry of digestion; and, lastly, though M. Raymond has proved that electricity is closely connected with muscular action, yet so imperfect is our knowledge of animal chemistry, so much remains to be done, that I cannot but ask for your utmost indulgence, both for myself and for my subject.

Still no knowledge can be more noble, none more useful, and none more difficult, than that which can be included in the term animal chemistry. It is noble because it professes to explain a small part of the mystery of life; it is useful because it should guide the application of chemical substances to the alleviation and cure of diseases. It is difficult because of the peculiar and complicated circumstances in which the chemical actions in the body take place; so peculiar and so complicated that it cannot be said that the same action ever takes place twice in the human body under precisely similar circumstances.

To you who know well the elements of chemistry, I need not mention the influence of circumstances on chemical actions in inorganic chemistry. You know well how these circumstances determine whether hydrogen combines with oxygen or oxygen separates itself from hydro-

gen ; whether carbonate of potash is decomposed by acetic acid, or acetate of potash decomposed by carbonic acid. In organic chemistry you know that the instances of the influence of circumstances in the laboratory are innumerable. The various kinds of fermentation of sugar will present themselves the most readily to your minds as an illustration of this fact.

Think, then, how mental, nervous, muscular, and cellular forces must affect the circumstances under which chemical actions occur in the human body.

Moreover, as yet, animal chemistry has not formed the great object of chemical research.

Chemistry at first was occupied with the examination of inorganic substances only. The mineral kingdom has furnished, and the animal kingdom has yet to become the principal subject of scientific chemical research.

The greater part of the energy and talent of the chemists of the present day is at work on vegetable organic chemistry ; making analysis ; finding equivalents ; tracing substitutions ; investigating organic radicals ; searching for new processes for the formation of organic substances, as alkaloids ; advancing the progress of agricultural chemistry. Everywhere we see the chemist working in the vegetable kingdom.

But even now animal chemistry is occupying more and more the attention of the best minds, and it will ultimately become the chief object of investigation.

The extent of knowledge that has to be obtained will be best seen as these lectures proceed, for I shall too often have to point out where our knowledge will be made more clear by future research. I shall do this the more readily, because I consider it is one grand object which can be obtained by lectures. For though the squaring and fitting of the knowledge we have acquired is very important, still more does our progress depend on the clear comprehension and demonstration of what is wanted and what must be procured.

In a chemical point of view, I think I shall most clearly bring before you the chemistry of the food of man, if I consider first the nature of the food of plants,—what it consists of,—whence it is procured,—whether the same food is good for all plants,—how the proper food or manure for each crop is determined. These are some of the questions which relate to the food of plants ; and if I can make the answers clear to you, you will be enabled to see the relations and contrasts between plants and animals, and you will be the better able to understand what I shall say regarding the food of man.

You will immediately think of the composition of soils as represented by this analysis.

	Soils.		
	Fertile.	Medium.	Barren.
Silica.	7767	9214	8465
Alumina.	445	149	50
Oxides of Iron.	515	308	82
Oxide of Manganese. ..	83	31	3
Lime.	212	59	13
Magnesia.	153	36	7

	Soils. Fertile.	Medium.	Barren.
Potash and Soda.	24	14	2
Phosphoric Acid.... ..	68	6	13
Sulphuric Acid.	56	1	1
Chlorine.	4	2	3
Organic Matter.	247	106	1200
	9574	9926	9839
Loss..	426	74	161
	10000	10000	10000

and of manures, as of guano, of bones, of phosphates, of mineral manures. These are the substances which are thought of most importance by those whose business it is to feed plants. Why is this? I shall not occupy your time here by any arguments against the doctrines of the transmutation of the chemical elements. I shall assume that all my hearers are as sure that carbon cannot be changed into nitrogen as that lead cannot be changed into gold. However much has been said and written on the transmutations of elements and forces, I shall assume that transmutations have to be proved and are not probable. That close similitudes and still unknown relations exist between elements and forces, is very probable; but the proof of transmutation is a totally different thing from the proof of resemblance or relationship. Thus, the proof that the chimpanzee bears the nearest resemblance to man may be easy; but this is totally different from the proof of the transmutation of a monkey into a man. Iron may be closely related to manganese, but this is very different from the conversion of manganese, into iron. Chemically transubstantiation cannot be proved. If, then, one element cannot be converted into another, a plant to grow or increase in substance must somewhere and somehow obtain the different elements of which its growth or new substance is composed. If its growth consist of fourteen elements, as

Ultimate Elements of Food.

Carbon, ...	C 6	Chlorine.	Cl 36
Hydrogen.	H 1	Sodium.	Na 24
Oxygen.	O 8	Calcium.	Ca 20
Nitrogen.	N 14	Potassium.	K 32
Sulphur.	S 16	Magnesium.. ..	Mg 12
Phosphorus.	P 32	Iron.	Fe 28
Silicon.	Si 15	Manganese... ..	Mn 28

each of these elements must be procured from without the plant; for it is assumed that calcium cannot be changed into potassium, nor sulphur into phosphorous, nor carbon into nitrogen. If it be inquired, what food is most nutritious or best for any plant to make it grow? the chemist answers, "I must know first of what elements the plant consists; secondly, what elements exist already around the plant." Then, knowing what must be there, and knowing what is already there, he can immediately say whether anything, and what thing, is

wanting and must be given to enable the plant to obtain all those elements of which its growth is formed.

As regards plants, some of the elements always exist around them in such form and in such quantity, that little or no attention is paid to them. The carbonic acid and water of the atmosphere furnish the carbon, the hydrogen, and the oxygen, in the minutest state of subdivision. Thus, in speaking of the food of plants, but little is thought or said of the carbon, the hydrogen, and the oxygen. The source of the nitrogen of the plant is a matter of dispute,—Professor Liebig thinking that it arises solely from the ammonia in the air. Others think the nitrogen of the atmosphere may be used for the growth of the plant.

Another source of the nitrogen of plants may be the oxides of nitrogen which exist in the atmosphere. In a paper which was lately read before the Royal Society, I have stated that nitrous acid may be detected without any difficulty in rain water. It exists not only in the rain which falls during a thunderstorm, but in that which fell in different rainy days this autumn. I have found it every time I have looked for it, not only in that rain which fell in London, but at Kingston, and in Dorsetshire, far from any town, and on the south coast of Ireland with a south wind blowing. In all the rain water I have examined I have found nitrous acid. From two pints to twenty pints were evaporated, a small quantity of pure carbonate of potash being added to prevent the escape of the acid. When reduced to about a drachm, the residue was tested by starch, dilute solution of hydriodate of potash, and very dilute hydrochloric acid, when the iodide of starch immediately appeared.

In the young plant also it is most probable that the highly albuminous compound which is found stored up in the seed is provided for the formation of the earliest growth of the young cells, before they have acquired that activity by which they can form albumen for their further development. But the sulphur, the phosphorus, the calcium, the potassium, whence do these come? The lime and potash cannot be brought to the plant by the air. They must, therefore, exist in the soil; and, if they are not present in the soil, then the plant cannot get them and cannot grow. Here then is the reason why the plant feeder thinks of guano, of phosphates, and of mineral manures. The air cannot bring these elements to the plants; the plants cannot grow without them; and, as the plants cannot move, the elements must be brought to the plants. If carbon, hydrogen, or oxygen did not exist in the air or soil, then it would be as necessary to procure these elements elsewhere and to bring them to the plant, as it is to procure lime or potash, otherwise no growth would ensue. But carbon, hydrogen, and oxygen are ever present in the air, in the most finely divided state, and in such plenty, that no further supply of these is necessary. Very different is the fact regarding the other elements,—phosphorus, sulphur, alkalies, earths, and salts. If all plants consisted of the same elements, in the same proportions, they would all require the same substances to be present in the soil to enable them to obtain their sustenance,—all would live on the same food; but analysis shows that plants do not contain

the same quantities of the elements; even the different parts of plants, though they may have the same elements, do not contain them in the same proportions. Quantitatively, if not qualitatively, different species of plants contain differences in their elements, so that a soil which might contain just those elements in the proportions suited to one kind or part of a plant or vegetable, might be deficient in the proper quantities of one or more elements, which must be present in different quantities in another kind of vegetable or part of a plant. Thence we may deduce the grand chemical or substantial law regarding the chemical composition of the food of plants. Every chemical element which analysis finds in a plant must be present in the air or soil around that plant in quantity proportioned to the want of the plant. This is the chemical condition without which the plant cannot grow.

A mechanical condition also exists, closely related to the chemical condition; and the mechanical law, or the law of form, is, that the chemical elements must exist in a very fine state of division.

When I speak of mechanical condition, I do not intend that it is a state which must be produced by mechanical means alone. The fine state of division may be produced partly by mechanical, partly by chemical action. The fine state of division might be effected solely by chemical actions. I contrast the chemical with the mechanical law, solely to bring out strongly before you the importance of the state of division of the food of plants. The finest possible state is the gaseous state; next to this the liquid state, a state of solution. If the chemical elements requisite for any plant exist in the soil locked up, that is, in a state in which they cannot be finely divided nor dissoled in water, they cannot be used by the plant for its growth or maintenance. The richest manure, if in an insoluble state, would be of no more benefit to the fields than the miser's hoards to the wealth of the country. The plough and the manure, the mechanical and the chemical agent, are as mutually connected as form and substance.

I will take the growth of grass and of corn as my examples to illustrate what I have now been saying; and I take grass because all flesh is grass. Of what, then, does grass consist? We will first look at its ultimate elements, tracing whence they come and what they ultimately form:—Carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, silicon, calcium, iron, magnesium, potassium, sodium, chlorine. To furnish these elements, in the air, the water, and the soil, we find carbonic acid, water, ammonia, nitrates, sulphates, phosphates, silicates, lime, magnesia, and potash, soda, and iron. The chemical law is, that if any element is absent, the grass cannot grow. The mechanical law is not less essential; the form in which the elements must exist is by no means unimportant. A fine state of division,—the gaseous or liquid form,—is necessary. Wherever grass grows, these elements are found as gases dissolved in the air, or as liquids, that is dissolved in water, whereby they are enabled to enter into the composition of the plant.

The growth of the grass consists in the combination of the elements of the food into certain groups or proximate constituents, which are arranged in a peculiar form, differing according to the species of the plant.

It has been said that the growth of the grass consists in the formation of organic matter out of inorganic elements ; but this opposition between organic and inorganic matter cannot be strictly maintained, for the inorganic elements enter into the composition of the plant as constantly as the organic elements. In truth carbon, hydrogen, oxygen, and nitrogen are not more organic elements than sulphur, potash, lime, iron, chlorine, iodine, sulphur, phosphorus, potassium, sodium, calcium, silicon, iron, manganese, all of which enter into the structure of organic substances ; not to the same amount or extent as carbon, hydrogen, oxygen, or nitrogen, but as essentially and as intimately. They are not incidental elements. Take as an example the iron in the blood ; it is as necessary for the colouring matter as the carbon, hydrogen, oxygen, nitrogen. Without the iron a totally different substance, with different properties, would be produced.

If I separate the water from this grass I obtain hay ; if I burn it I get the ashes such as you see here from a fused hay-stack ; if I treat it with ether and alcohol a beautiful crystaline fatty matter can be obtained ; and by heating it thus with soda and lime, I can show you the ammonia which comes from the albuminous matter present in the grass. Here are some analyses of the quantities of these substances present in hay :—

Composition of Grass.

	Lucerne.	Tussac Grass Tops.	Hay.
Albumen.	1·9	4·79	7·1 to 6·4
Starch.	2·2		
Woody fibre	14·3		
Sugar.	0·8	18·67	76·7 to 0·0
Extractive matter.	4·4		
Fatty matter.	0·6		5·0 to 3·0
Phosphate of Lime.	0·8	1·37	5·0 to 0·0
Inorganic matter.			
Water.	75·0	75·17	7·2 to 13·9
	100·	100·	100·

Ashes of Hay.

Silica.	60·1	Gypsum.	1·2
Phosphate of Lime.	16·1	Sulphate of Potash.	2·2
Phosphate of Peroxide of Iron.	5·0	Chloride of Potassium.	1·3
Lime.	2·7	Carbonate of Soda.	2·0
Magnesia.	8·6	Loss.	0·8
Total.	100·0		

In each portion of the grass four classes of substances may thus be proved to exist :—1st, water ; 2nd, salts, which give ashes ; 3rd, organic substances, containing little or no nitrogen, and 4th, organic substances containing much nitrogen.

Instead of dwelling longer on grass, the food of animals, it will be well to take wheat, the food of man.

Here is the ultimate and proximate analysis of wheat :—

Wheat Flour.

Ultimate Elements.	Proximate Constituents.
1. Carbon.	1. Gum.
2. Hydrogen.	2. Sugar.
3. Oxygen.	3. Starch.
4. Nitrogen.	4. Lignine.
5. Sulphur.	5. Fat.
6. Phosphorus.	6. Albumen.
7. Calcium.	7. Fibrin ?
8. Magnesium.	8. Casein ?
9. Silicon.	2. Glutine.
	10. Ashes.
	11. Water.

Wheat Ashes.

	Grain.	Straw.
Chloride of Potassium.		15·13
Chloride of Sodium.	10·0	0·89
Potash.	23·18	0 68
Soda.	3·09	
Lime.	3·33	6·93
Magnesia.	11·75	1·69
Peroxide of Iron.	1·11	0·99
Phosphoric Acid.	46·36	5·05
Sulphuric Acid.		0·74
Silica.	1·18	67·90
	100·	100·

Each of these elements must be obtained from without the plant. If they are not present in the air, water, or soil, no growth takes place, and the mechanical law must also be satisfied. If the elements are present in the soil, and cannot be made soluble, the wheat cannot grow. How rich soever the soil may be, there must also be rain or dew, otherwise there will be no fertility. The elements cannot enter into the plant. The wheat cannot grow, because growth is the formation of new substance, and each portion of the substance of wheat contains water, salts, non-nitrogenous organic matter, constituting the five first proximate constituents of the wheat, and the nitrogenous organic matter, which composes the four following constituents in the table.

Suppose, for a moment, that no nitrogen could be obtained by the wheat, no albuminous substance could be formed ; and, as each particle of the wheat must contain an albuminous substance, if no nitrogen is present, no growth can take place.

If lime or potash were absent instead of nitrogen, the same impossibility for the production of grain would result.

The wheat actually contains these classes of substances is easily shown. Here you see the water ; here are the salts ; here are the starch and fat ; here the nitrogenised organic substances are separated.

Hence, as regards the food of grass or wheat, two laws must be fulfilled,—a mechanical law and a chemical law.

1st. Every element of the plant must exist around the plant. 2nd. In that state in which it is capable of passing into the plant.

Already the importance of the mechanical law can be made apparent to you. For if the elements, after they pass into and become part of the grass and the wheat, are arranged in the same way, forming the same compounds,—if we find in both, 1. water ; 2. ashes ; 3. non-nitrogenous organic matter ; 4. nitrogenous organic substances,—both plants ought, chemically speaking, to be capable of forming the food of man. The grass is as capable as the wheat of fulfilling the chemical law of digestion. Nay, more ; the grass actually does give all the substances necessary for forming the nerves, the muscles, the blood, and the bone, to the ox and the ass. Why can it not do the same to man ? Why does not man live on grass also ? The answer to this question is, that grass cannot in man easily be made to fulfil the mechanical law of digestion,—that is, the substances which the grass contains are less capable of being finely divided than the substances which exist in wheat. The green colouring matter which is closely concerned in the deoxidation which takes place under the influence of light, on which the formation of organic compounds depends, and the woody fibre or skeleton which supports the green colouring matter, and exposes its surface to the light,—these insoluble substances hinder the solution of the salts, fat, starch, and albumen of the grass ; and, because the mechanical law cannot be fulfiled, the chemical constituents of the grass cannot serve for the food of man.

I have, then, in this lecture, tried to show you that the food of plants consists of each all and the elements which exist in the plant ; that these must also be present around the plant, in the air, the water, or the soil ; that the same food is good for all plants, but that different quantities of the elements are required for different kinds of plants, according as the different plants vary in the quantities of the elements of which they are composed ; and lastly, that the proper food or manure must be determined by comparing the substances in the plant with those which surrounded it. Not that it is sufficient to consider only the chemical composition of the surrounding substances ; the mechanical state is of equal importance. For if the elements exist in combinations which are incapable of being finely divided, they cannot be used for the support of the plant.

Thus the mechanical law is of equal importance with the chemical law, and it is on the fulfilment of both laws that the thriving of the plant depends.

In my next lecture I shall try to show you that the same two laws apply as rigidly to the food of man.—*Medical Times, March* 22, 1851.

PART FIFTH.

MISCELLANIES.

The following interesting Review is taken from the October number of the Edinburgh *Monthly Journal of Medical Science*, and we hope it will prove of sufficient interest to our readers.

On enlargements of the spleen, observed during an epidemic of intermittent fever, which attacked the 18th Regiment, Madras Native Infantry, in Goomsoor, in 1847-48. *By G. Smith, M. D. Assistant Surgeon, Madras Medical Service, contained in Medical Reports selected by the Medical Board from the Records of their Office, and published under the sanction of Government, Madras* 1850.

The Medical Board of the East India Company's Service in Madras have from time to time published valuable Reports by the Medical Officers of that Establishment, on important subjects connected with the pathology and treatment of the diseases of hot climates, and on the utility of various new remedies. In the series contained in the volume now before us, there are several interesting documents on the health of various corps in the Madras Presidency and on the medical topography of some of its districts. One of the most interesting, however, of the whole is the paper of which the title is given in detail at the head of this article. It is important in several respects, but most especially at the present time, as supplying impartial evidence for testing the theory which has been for some time supported by M. Piorry, and his followers, regarding the pathology of intermittent fever.

According to Piorry, intermittent and remittent fever own a distinct anatomical cause, as they depend on an enlarged condition of the spleen. He maintains, that in all distinct cases of intermittent fever the spleen is more or less enlarged in volume, that he has found it enlarged in 154 cases out of 161, and painful in 4 of the remaining 7, that after two or three attacks of intermittent, the spleen is always observed to exceed its natural dimensions ; that it is more voluminous during the paroxysms than during the intermissions, that the paroxysms diminish in severity as the spleen gradually regains its ordinary size, and that, under the use of large doses of quinine, its morbid enlargement is reduced with great rapidity. Were these facts all genuine, the inference would be almost irresistible, that intermittent depends on enlargement of the spleen ; and that quinine cures the disease by a specific action, which quickly reduces congestion of the organ.

The doctrine of Piorry has gained many converts in France, but few in this country ; yet we are not aware that it has been fairly put to the test by any actual observations in Britain. Our experience on the

subject is necessarily limited, becaase few cases of intermittent are observed in Edinburgh. But among those which are occasionally met with in the persons of Irish railway labourers and reapers, who have contracted the disease in the fenny parts of Lincolonshire and Cambridgeshire, we have been seldom able to observe any unequivocal enlargement of the spleen, and on only one occasion could remark an enlargement during the fit, and contraction after the sudden arrestment of the disease by a few large doses of quinine.

The experience of Dr. Smith, on a most extensive scale of observation appears to us to set the question at rest against the views of Piorry. Few have been more favourably circumstanced for carrying out such an inquiry. Goomsoor, the station where his observations were made, is regarded as the Walcheren of India. Here in a native regiment with an average strength of 900 men, he had to treat no fewer than 4000 cases of intermittent in ten months. In the single month of May 38 per cent, and in the following month 44 per cent, of the strength of the regiment were admitted into hospital on account of this disease; and in the tenth month, 7 per cent of the whole force died from that cause alone.

Particular attention was paid to the condition of the spleen, which was examined, according to Piorry's method, by the pleximeter; and the following were the results. In 100 cases of quotidian and tertian fever examined within three months from the commencement of the epidemic, the spleen exceeded its natural size of four inches in length only twelve times; and in not one of nearly 700 cases was there any complaint of pain in the splenic region, even when smartly struck with the pleximetric hammer. Although the frequency of splenic enlargement increases with the frequency of the recurrence of the disease, still the organic affection is far from invariable even after many attacks. In 11 primary cases Dr. Smith did not detect any enlargement; in 19 cases of a second attack he observed it once only; in 25 cases of a third attack he witnessed it thrice; and in 45 cases, in which the disease had recurred oftener than thrice, he met with it eight times. Of 200 cases, taken indiscriminately at the close of the epidemic from the class of patients who had been repeatedly ill, there were only 35, or 17¼ per cent, who were affected with appreciable enlargement of the spleen. He could never remark, in cases in which the spleen was previously healthy, that its size increased during the paroxysm, and decreased again during the intermission; but this alteration was remarked in those who had enlarged spleen when attacked. Neither could he remark that the intensity of the paroxysm bore any relation to the size of the spleen. His observations as to the influence of quinine on enlargement of the spleen are acknowledged by him to be sufficiently numerous to test Piorry's statement effectually; but out of 17 experiments with large doses, he remarked no difference in 6, but a greater or less diminution of the spleen in 11.

A few well-observed negative facts are sufficient to throw very great doubts on the theory, that intermittent depends on congestion, or other disease, of the spleen. But negative results, so numerous and on so extended a scale of observation, upset it entirely. Of course, no one

doubts that the spleen is often much enlarged in the course of intermittent fever. This fact however is evidently, from Dr. Smith's inquiries, nothing more than what it was always supposed to be until Piorry's researches :—the spleen is enlarged consecutively, not primarily ; its enlargement being the effect, not the cause, of the fever. It is to be regretted that the author had no opportunity of investigating the anatomical characters of the disease of the spleen at its different stages. No doubt, however, can be entertained that for a long time it consists of congestion only. This appears sufficiently from the ease and rapidity with which it may in general be cured. In some cases, even in persons who had suffered often from intermittent, the mere arrestment of the fever, with the subsequent use of laxatives and diaphoretics, removed very considerable enlargement in periods varying from five to ten days ; in one instance a cure was effected in sixteen days, though the edge of the spleen was at one time an inch and a half below the umbilicus, and occasionally the cure takes place quite suddenly, the spleen returning to its natural size within four and twenty hours, though it may have remained much enlarged for several days after the cessation of fever. When these simple measures do not appear in a few days to promise speedy recovery, the remedies principally to be depended on are chalybeates, and the stimulus of pressure and kneading. Dr. Smith usually gave iron in the form of sulphate, and along with aloes and iodine. Two grains of sulphate of iron, two of aloes, and one of iodine, were given twice or thrice a day in the form of pill, made up with aromatic confection, and twice or thrice daily the enlarged organ was subjected to firm kneading with the hands. The efficacy of this treatment was tested by subjecting some severe cases in the first instance to diet, regimen, and laxatives alone without avail. Even where there is reason to suppose, from the long duration and great extent of the enlargement, that the disease must have advanced partially to the stage of hypertrophy, a cure may be accomplished by the same means ; but then it is tedious, and may extend through several months.

While it appears that few can resist the tendency to spleen disease in localities so favourable as Goomsoor to the production of intermittent, Dr. Smith mentions some interesting facts, in proof that some constitutional tendencies must predispose to visceral disease in such circumstances, and others operate as a protection. It is remarkable that in the epidemic he describes, the European constitution seemed less inclined to disease of the spleen than that of the natives. Of twenty-three European Officers, twenty had fever, but none of them suffered from enlargement of the spleen. And he adds the case of an officer, who had constantly remained exempt during repeated attacks of severe ague, throughout a period of twenty years. Age diminishes the predisposition ; for the disease occurred almost entirely among the young and middle-aged sepoys, the old members of the regiment, who suffered from fever, being very rarely observed to suffer from enlargement of the spleen.

Extract from an interesting book called Physic and Physicians.

(Continued from page 125.)

The most learned men of all ages, the most distinguished ornaments of literature, have combined in ranking very high the learning and humanity of medical men. "I will not stop to inquire," says Dr. Johnson, "whether what Temple says be true, that physicians have had more learning than the other faculties; but I believe every man has found in physicians great liberality and dignity of sentiment, very prompt effusion of beneficence, and willingness to extend a lucrative art, where there is no hope of lucre"*

Pope, in his epistle to Dr. Arbuthnot, says,

"Friend to my life, which did not you prolong,
The world had wanted many an idle song."

Dryden, in his "Postscript" to the translation of Virgil, pays a high compliment to his own medical friends, and to the profession generally. He says, "that I have received, in some measure, the health which I have lost by too much application to this work, is owing next to God's mercy to the skill and care of Dr. Guibbons and Dr. Hobbs, the two ornaments of their profession, whom I can only pay by this acknowledgment. The whole faculty has always been ready to oblige me." Pope says, in a letter to his friend Allen, a short period before his death, "there is no end of my kind treatment from the faculty. They are in general the most amiable companions, and the best friends, as well as the most learned men I know."

Judge Blackstone in his introduction to his celebrated "Commentaries," speaks in the highest terms of the learning of medical men. He says the medical profession, beyond all others, has remarkably deserved the character of general and extensive knowledge.

Linacre, the founder of the College of Physicians was the first Englishman who read Aristotle and Galen in the original Greek. On his return to England, having taken degree of Doctor of medicine, at Oxford, he gave lectures on physic and taught the Greek language in that University. He was considered the purest Latin scholar of his day. Erasmus says, of him "*vir non exacti tantum sed severi judicii*" he not only published works on medicine, but also contributed much to the Philosophy of Grammar, and wrote a work on Mathematics. He was successively Physician to Henry VIII, Edward the VI and to Princess Mary.

Dr. Caius, an English Physician, read Lectures on Aristotle in the University of Padua. He founded Caius College, and endowed it with considerable estates, for the maintenance of a number of fellows and scholars.

Pythagoras, Democritus, and Aristotle, names that will be held in veneration by the learned as long as philosophy is made the subject of study, did not consider it beneath their dignity to devote themselves to the study of the science of medicine.

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* Life of Sir S. Garth.

It may be truly said, that there is no study which tends to exalt the human mind to more liberal and extended views of human nature, than that of which we have been speaking. It is the one best fitted to interest, to divest the feelings of prejudice, and to form both the moralist and the philosopher. In taking a view of human nature, and in studying the characters of men, it teaches us to lay aside all the adventitious qualities, and all the meretricious ornaments which fortune and favor may confer. It levels all distinctions and views, even "Cæsar as cold dumb clay," a mass of matter which exhibits no difference in its composition from that of the vilest of the vile. A good authority has justly observed, that no profession reqnires so comprehensive a mind as medicine. In the other learned professions, considered as sciences, there is a certain established standard, certain fixed laws and statutes, to which every question must constantly refer, and by which it must be determined. A knowledge of this established authority* may be attained by assiduous application and a good memory. There is little room left for the display of genius, where invention cannot add, nor judgment improve; because the established laws, whether right or wrong, must be submitted to. The only exercise for ingenuity is in cases where it does not clearly appear what the laws are. But even then, as disputable points must be referred to the opinions of the judges, whose opinions being formed from various circumstantial combinations, frequently differ, there is no criterion by which the ingenious reader can be judged, and his conclusions, whether well or ill drawn, must still remain undecided. The case is very different in medicine. There we have no established authority to which we can refer in doubtful cases. Every physician must rest on his judgment, which appeals for its rectitude to nature and experience alone. Among the infinite variety of facts and theories, with which his memory has been filled, in the course of a liberal education, it is his business to make a judicious separation between those founded on nature and experience, and those which owe their birth to ignorance, fraud or the capricious system of a heated and deluded imagination. He will find it necessary to distinguish between important facts, and such as, though they may be founded on truth, are notwithstanding, trivial or utterly useless to the main ends of his profession. Supposing these difficulties surmounted, he will find it no easy matter to apply his knowledge to practice.

We had a most elevated idea of the dignity of physic, when we commenced our medical career. We held all other professional grades in comparison with our own, in great contempt. Time has to a certain extent cooled our enthusiasm, and a knowledge of the world has somewhat elevated our notions of lawyers and clergymen.

Law is not the profession to which we should have liked to have been educated. We consider lawyers, however, in the present constitution of society as a necessary part of the body politic; and until men can make up their minds to settle their own disputes, we cannot conceive how we can do without the gentlemen of the long robe. The establishment of Courts of arbritration, as suggested by Lord Broug-

* Dr. Gregory.

ham, might prevent, to a certain extent, litigation but it would not altogether enable us to dispense with the disciples of Coke and Blackstone, Pope says, "all partial evil is universal good" and so we must bow to circumstances.

We certainly do not think that law, as at present studied, is calculated to increase our stock of worldly wisdom. How few study the philosophy of legal science. The mind cannot be enlarged, the faculties expanded, and the judgment matured, when it is often employed in making the "worse appear the better reason"—in fact, in perverting truth. A counsel enters the Court to make out his case, and instead of endeavouring to establish the truth, which ought to be the object of all our investigation, he frequently exercises all his wit, learning and eloquence in its perversion, and so dumfounds, in the midst of learned Jargon, the poor jury and the unfortunate persons examined. How graphically has Lord Brougham described the melancholy situation of a brow-beaten witness when placed at the mercy of two witty barristers.* The state of medicine may be considered as the criterion, or barometer of the state of general science in a nation. Wherever the arts and refinement have extended their influence, there medicine will be particularly cherished, as conducive to the interests and happiness of mankind. This explains the miserable state of physic in Europe so late as the tenth century, when there was scarcely a physician in Spain. Sancho, the fat King of Leon, was obliged to make a journey to Cordova, in 956, to put himself under an Arabian physician, who though sent for by the king, resolved that the king should come to him.

(To be continued.)

GENERAL ORDERS.

LEAVE TO MEDICAL OFFICERS.

G. O. G. 9th Dec. 1851 No. 231.—The undermentioned Officer is permitted to return to Europe.

Aasistant Surgeon Matthew Kane M. B. on Medical certificate, to embark from the Presidency.

G. O. C. C. 6th Dec. 1851.—Assistant Surgeon W. Lloyd M. D. 2 N. V. B. from 15 to 21st December 1851. Presidency, under G. O. G. 11th April 1851.

G. O. C. C. 20th Dec. 1851.—Surgeon J. Gill 2nd Battallion Artillery from 20th January 1852 to 20th January 1853. Neilgherries and Bangalore.

Veterinary Surgeon E. C. Collins 2nd Light Cavalry from 19th December 1851 or date of departure for 30 days, Madras under G. O. G. No. 71 of 1851.

G. O. C. C. 31st Dec. 1851.—Assist. Surgeon H. R. D. Marret, 2d. Regiment N. I. from 26th December 1851 to 26th February 1852. Mangalore.

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* "Does not a barrister's affected warmth, and habitual dissimulation, impair his honesty?" asked Boswell of Dr. Johnson: "Is there not some danger that he may put on the same mask in common life, in the intercourse with his friends?"—"Why, no sir," replied the Doctor. "A man will no more carry the artifice of the bar into the common intercourse of society, than a man who is paid for tumbling upon his hands will continue to do so when he should walk on his foot."

G. O. G. 13th Jan. 1852.—Surgeon W. Evans M. D., Surgeon of the General Hospital for 1 year and 8 months from date of embarkation to Sea, the Cape of Good Hope and Australia on Medical Certificate.

G. O. C. C 3d Jan, 1852.—Assistant Surgeon W. Lloyd M. D. 2d N. V. B. in continuation to 14th May 1852. Presidency,

Veterinary Surgeon E. Crundall 4th Regiment Light Cavalry from 16th December 1851 to 31st December 1853. Neilgherries S. C.

MEDICAL SUBORDINATES.

G. O. C. C. 6th Dec. 1851.—Assistant Apothecary H. Fisher D. D. 1 N. V. B. late attached to Artillery at Aden, from 12th September 1851 to 15th September 1852, St Thomas's Mount S. C.

G. O. C. C. 15th Dec. 1851,—2nd Apothecary J. Yaull H. M's 25th Regiment doing duty Suptg. Surgeon's Department Malabar and Canara from 10th December 1851 for six months. Bangalore S. C.

G. O. G 16th Jan. 1852 *No* 11.—Senior Appothecary A. Harris, doing duty at the Chintadripettah Dispensary for six months from the date of embarkation to the Straits.

G. O. C. C. 27th Jan. 1852.—2nd Apothecary C. Dashwood, 1st Madras Fusiliers in continuation to 30th September 1852 Presidency and Coast S. C.

Assistant Apothecary J. Pollett, 1st Madras Fusiliers in continuation to 31st March Cuddalore S. C. under the provisions of para 5 page 220, Sec 18 of the General Regulations.

PASSED EXAMINATION IN NATIVE LANGUAGE.

G. O C. C. 29th November 1851,—Veterinary Surgeon E. Crundall. In Hindoostanee for Veterinary Charge.

MISCELLANEOUS.

G. O. G. 5th December, 1851—No. 229.—The undermentioned officers who arrived at Madras on the 1st December 1851, have returned to their duty by permission of the Honorable the Court of Directors, without prejudice to their rank.

Surgeon J. Dorward,
Surgeon W. G. Davidson.

Mr. Frederick James Windus who arrived at Madras on the 1st December 1851, is admitted upon the Establishment as an Assistant Surgeon in conformity with his appointment by the Honorable the Court of Directors, and is directed to do duty under the Surgeon of the 2nd European Light Infantry at Secunderabad.

G. O. G. 16th December 1851.—The undermentioned officer has returned to his duty by permission of the Honorable the Court of Directors, without prejudice to his rank,

Assistant Surgeon H. F. C. Cleghorn M. D. arrived at Madras on the 12th December 1851.

Dr. Colvin Smith, who arrived at Madras on the 14th December 1851, is admitted upon the Establishment in conformity with his appointment by the Honorable the Court of Directors, and directed to do duty under the Surgeon of the 2nd Battalion Artillery.

In the Judicial Department under this date, the resignation of Assistant Surgeon G. E. Aldred, M. D. of his appointment of Zillah Surgeon of Ganjam has been accepted, and his services are placed at the disposal of His Excellency the Commander-in-Chief.

G. O. C. C. 3rd December 1851.—The undermentioned Medical Subordinates are appointed to afford Medical aid to the Detachments of the 1st Native Veterian Battalion under order to proceed from Madras.

Assistant Apothecary W. Wood, Superintending Surgeon Department Presidency.	Detachment proceeding to Chittoor.	Returning thence to Madras.
2nd Dresser Vencatasawmy No 81 attached to the General Hospital.	Detachment proceeding to Salem.	

G. O. C. C. 10th December 1851.—So much of G. O. C. C. of the 25th ultimo as appoints a Medical Officer from Trichinopoly to sit as a Member of the Board of Medical Officers to assemble at Ootacamund on the 30th Instant for the Examination of Sick Officers is cancelled.

G. O. C. C. 15th December 1851.—2nd Dresser V. Barthasarathy No. 197 of the 52nd Regiment N. I. is directed to proceed forthwith to Nellore and to do duty in the Civil Dispensary at that Station, during the indisposition of 2nd Dresser Moonesawmy Naidoo. No. 130, returning to his Regiment, as soon as his services can be dispensed with.

G. O. C. C. 18th December 1851.—With the sanction of Government, Assistant Surgeon F. J. Windus, recently arrived and appointed to do duty with the 2nd European Light Infantry will proceed in Medical charge of the Detachment of Recruits for the 2nd European Light Infantry under orders to proceed from St. Thomas's Mount to Secunderabad.

Surgeon W. G. Davidson, is appointed to do duty with the 2nd Battalion Artillery, during the absence on Sick Certificate of Surgeon J. Gill.

Assistant Apothecary J. J. Wood of the 43rd Regiment N. I. is relieved from doing duty at the Government Dispensary.

Acting Assistant Apothecary R. A. Leonard of the 2nd Regiment N. I. is appointed to do duty at the Government Dispensary, until the arrival of Assistant Apothecary G. Honor.

G. O. G. 16th December 1851—No. 538.—The following extract from a letter from the Honorable the Court of Directors in the Military Dapartment, dated 2nd October 1851, No. 61, is published for the information of the Army.

Letter dated 29th October 1851, No. 61.

We have permitted the undermentioned Officers to return to their duty, viz.

Surgeon James Dorward.

Assistant Surgeon James Thompson.

G. O. G. 19th December 1851—No. 240.—Mr. James Edward Dickinson who arrived at Madras on the 17th December 1851, is admitted upon the Establishment as an Assistant Surgeon in conformity with his appointment by the Honorable the Court of Directors, and directed to do duty under the Surgeon the 2nd Battalion Artillery at Saint Thomas's Mount.

G. O. G. 26th December 1851—No 246.—Surgeon James Supple, who arrived at Madras on the 18th December 1851, has returned to his duty by permission of the Honorable the Court of Directors without prejudice to his rank.

Acting Apothecary Joseph North, having passed the prescribed examination for the grade of Apothecary is confirmed in that rank from the 25th July 1851.

G. O. G. 30th Dec. 1851—No. 247—The following Extracts from letter from the Honorable the Court of Directors in the Military Department, dated 19th November 1851, No. 71 was published for the information of the Army.

Letter dated 19th November 1851, *No.* 71.

4th Surgeon Hugh Cheape who was granted by your Government leave to proceed to Egypt on Sick certificate in July last, having been compelled on account of the state of his health to come on to this country has applied to us to be admitted to the benefit of a furlough on Medical certificate which has been granted for 6 months.

6th Assistant Surgeon Edward Young has been permitted to retire from the Service on account of the state of his health.

G. O. G. 30th Dec. 1851—No. 248—The date of rank of Assistant Surgeon James Edward Dickinson, is fixed from the 10th September 1851.

G. O. C. C. 24th Dec. 1851.—With reference to G. O. C. C. of the 3d Inst. the undermentioned Medical Subordinates have been passed by the Board of Examiners.

Acting Apothecary Joseph North... } as Apothecaries.
Second Apothecary Peter McIntyre. }

Assistant Apothecary William McLean as Second Apothecary.

G. O. C. C. 27th Dec.—The undermentioned youths having been reported by the Board of Examiners as qualified and eligible for the Medical Service, they are accordingly admitted as Unpaid Candidates and ordered to do duty as under.

Names.	*Schools educated at*	*Where to do duty.*
William Trutwein.	St. George's Parochial School 3 years, Bishop Corrie's Grammar School 4 months, the last 8 months at Home.	Triplicane Dispensy.
Henry Boon,.....	Vepery Grammar School....	Dispensary 2d District.
Robert Samuel James Hurst.	St. Andrew's Parochial School 2 years, Mount Road School 3 years, and the last year Vepery Grammar School.	Triplicane Dispensy.
Easton Alfred Morris...	Black Town Orphan Asylum... ...	Native Infirmary.

G. O. C. C. 30th Dec. 1851—2nd Dresser A. Fegrado No, 155, of the Superintending Surgeon's Department Presidency is directed to proceed and do duty in the Collectors Department Northern Division of Arcot, during the temporary employment of 2nd Dresser G. Vencatasawmy No. 188, in the Dispensary at Chittoor.

O. O. O. C. 6th January 1852, No. 2.—The Right Hon'ble the Governor in Council is pleased to make the following appointments.

Assistant Surgeon Henry Stanbrough to be Surgeon of the 4th District, vice Surgeon Henry Cheape, M. D. proceeded to Europe, to take effect from Surgeon Cheape's embarkation.

The leave of absence granted to Assistant Surgeon (now Surgeon) J. Supple in the Medical Department under date the 16th April 1850, is to be considered to have effect from 2d March 1850.

In the Medical Department under this date, Assistant Surgeon James Crawford has been appointed Civil Surgeon of Masulipatam, vice Assistant Surgeon H. Stanbrough.

G. O. C. C. *5th Jany.* 1852.—2d Dresser Ninapreiagosum No. 126, doing duty at the General Hospital, is directed to proceed forthwith to Nellore and do duty in the Civil Dispensary at that Station, during the indisposition of 2d Dresser Moonesawmy Naidoo No. 130, returning to Madras as soon as his services can be dispensed with vice 2d Dresser Parthasarthy No. 197 of the 52d Regiment N. I. reported Sick.

G. O. C. C. *6th Jany.* 1852.—Surgeon James Dorward, is appointed to do duty with the 37 Grenadiers from date of departure of Surgeon T. D. Harrison of that Corps.

G. O. C. C. *8th Jany.* 1852.—Junior Medical Apprentice G. Handerson, attached to the General Hospital, is discharged the Service from the 25th Ultimo, in consequence of having deserted from that date.

G. O. C. C. *9th Jany.* 1852.—Surgeon Supple, 21st Regiment N. I. now at the Presidency, is appointed to afford Medical aid to the Detachments of H. M's 15th Hussars and 25th Foot and 1st Madras Fuseliers and Sappers and Miners, under orders to proceed from Poonamallee to Bangalore.

2d Apothecary P. McIntyre of H. M.'s 15th Hussars, now at Presidency, will do duty with the above Detachments.

Assistant Surgeon H. F. C. Cleghom M. D. now at Presidency, is appointed to afford Medical aid to the Detachment of H. M.'s 84th Regiment, under orders to proceed from Poonamallee to Trichinopoly until relieved by a Medical Officer from H. M.'s 84th Regiment to be detailed by the Officer Commanding Southern Division.

Acting Assistant Apothecary R. A. Leonard of the 2d Regiment N. I., now at the Presidency, will do duty with the above Detachment.

G. O. G. 16th January 1852.—The following Extracts from a Despatch from the Honorable the Court of Directors in the Military Department dated 3rd December 1851, No. 75, are published for the information of the Army.

Letter dated 3rd December 1851, *No.* 76.

Para 1. We have permitted the undermentioned Officers to return to his duty, viz.

Assistant Surgeon George Mackay M. D.

2. The permission to return granted to Assistant Surgeon J. Thompson as announced in our letter dated 29th October 1851, No. 61, has been cancelled in compliance with his request.

4. Surgeon R. H. Manley of the Invalid Establishment, who in accordance with our orders of the 2d October 1850, has been sent to this country with a view to his being placed on the Retired List, has under the recommendation of our Examining Physician been allowed to remain six months in this Country, that an attempt may be made for his cure, previous to his retirememt.

G. O. C. C. 16th January 1852.—Apothecary A. Harris of the Superintending Surgeon's Department Presidency Division, doing duty Chintadrapettah Dispensary, will rejoin his Department on being relieved by Assistant Apothecary Cole.

G. O. G. 20th January 1852 *No.*—Surgeon David Sturrock M. D. is permitted to retire from the Service on the pension of 250£ per annum, from the 6th January 1852.

G. O. G. 23rd January 1852.—Surgeon William Gilchrist M. D. to act as Surgeon of the General Hospital and Professor of Medicine and Clinical Medicine, during the absence of Surgeon W. Evans M. D., on Medical Certificate—to take effect from date of Dr. Evans' embarkation.

G. O. C. 26th January 1852.—Assistant Surgeon W. A. Anderson of H. M.'s 51st Light Infantry, with the permission of the Right Hon'ble the Governor, will accompany His Excellency Commander-in-Chief on his approaching Tour of Inspection, and afford Medical aid to Head Quarters, Escort and Public followers during the Tour.

Apothecary T. H. Edwards of the Supg. Surg.'s Dept. Presidency Division, will do duty under the above Medical Officer.

G. O. C. C. 27th January 1852.—Vety Surgeon E. C. Collins, 5th Regt. Light Cavalry, is permitted to join his Regiment at Secunderabad via Madras.

ORDERS OF IMPORT.

G. O. C. C. 13th December 1851, *No.* 76.—With reference to G. O. C. C. of the 16th September last, No. 51, the Commander-in-Chief directs it to be notified that para 3d of the above G. O. is not applicable to Medical Officers and that Committees are to be assembled whenever Medical Officers wish to pass examination, in the Native Language for Medical charge.

G. O. C. C. 13th January 1852, *No.* 8.—The Commander-in-Chief directs it to be notified that the Governor has sanctioned the transfer of the Apothecary hitherto allotted to the Chintadrapettah Dispensary to Sircy and of the Assistant Apothecary at the latter place to the Chintadrapettah Dispensary.

PART FIRST.

ARTICLE 1.—*Intermittent Fever.* By Assistant Apothecary G. NORTON. Continued from page 149.

Treatment.—The treatment of ague is divided into two parts, viz., that which is proper during the paroxysm, and that which is necessary during the interval.

1. *Treatment during the paroxysm.* The indications of cure during the continuance of the paroxysm are, to hasten the stages if possible—to combat particular or urgent symptoms—and to relieve local congestions when present. To fulfil these indications severally, much will depend on the nature of the intermittent. In some localities, the disease is of so mild a character, that there is little need for interference. Each stage will follow its precursor in regular order, and the paroxysm will terminate in due time. The following is a general outline of the treatment.

In the *cold stage*, external warmth, by covering the patient with blankets; the exclusion of drafts or currents of air; the application of hot water bottles to the soles of the feet and to the epigastrium when needed; hot diluents, (conjee water answers remarkably well): a gentle emetic, by determining the blood to the capillary circulation often diminishes the intensity as well as the duration of the cold fit, and hastens its successor the hot stage. I am no advocate for the use of emetics; vomiting to say the least, is a very distressing symptom—the excitation of it where it does not occur naturally, does good in some cases, but I object to the indiscriminate use of emetics. To such practice no doubt in many cases are to be attributed in some measure the permanently deranged stomachs we witness in individuals cured of fever. Emetics would be objectionable in cases of sanguineous temperament, or where there is a tendency to local determinations to the Brain. A distinguished writer remarked that "emetics relieve fever by cutaneous revulsion, where they fail to do so, they aggravate the symptoms." This is a very correct statement, and is exemplified in practice. The late Dr. McIntosh I believe was the first who strongly advised and practised blood-letting in the cold stage of intermittents. The principle on which this plan of treatment is based, is that in the cold fit there is a recession of vital activity from the circumference towards the centre, leading to engorgement and congestion of internal organs. The abstraction of blood relieves the organs from this oppressed condition, equalizes the circulation, and restores the balance of function. In the case of a European attacked with intermittent fever, I took 8 ozs. of blood from the arm in the cold stage—the result was satisfactory—the

period of convalescence was considerably diminished, and the individual was discharged cured. About a month after he left hospital, he was readmitted, with symptoms of acute dysentery, which presented a very aggravated character, and he died in the most fearful form of *subsultus tendinum:* the movements of his limbs were so powerful, and the *risus sardonicus* that closed the scene of his existence so appalling, that the bystanders were shocked at the sight. He was of very intemperate habits, and was about 37 years of age.

Dr. Twining in his work on the "Diseases of Bengal" speaks favorably of blood-letting in intermittent fevers. He remarks that "the benefit of bleeding in the cold stage of intermittents is now so well known in India, that in a great number of cases it arrests the paroxysm, and is the best mode of preventing those ulterior visceral engorgements and indurations which often prolong the disease till the constitution is ruined." I do not think that blood-letting is generally resorted to for the cure of intermittents in the cold stage by practitioners in Southern India, at least by those in the Madras Presidency. The native constitution is ill adapted for such treatment: the natives have an abhorrence of blood-letting under ordinary circumstances, and their aversion to it would be increased if it were attempted to be practised in the cold stage of fevers. I may also mention that it is not very easy to bleed in such cases, the patient being in a state of general tremor; when a vein is opened, the blood at first flows with difficulty, trickling down the arm. The difficulties attending the practice of venesection in the cold fit in the female must be considerably increased. Apart from the timid nature of their disposition, and the horror excited in their minds at the sight of blood, which in many gives rise to syncope, even when they themselves are not the subjects of venesection, the veins at the bend of their arms are by no means so prominent or distinct as in the other sex, being in most cases imbedded in a quantity of cellulo-adipose substance, to which females in general owe the rotundity and graceful appearance of their limbs. I had occasion to bleed a Eurasian woman who was attacked with intermittent fever, but I dared not do so in the cold stage, I found it impracticable for the reasons above stated: on the setting in of the hot stage, I opened a vein, my guide being the pulsation of the artery at the bend of the arm, I succeeded remarkably well, and the operation had the salutary effect of keeping under control the symptoms, which previous to that threatened to take a rather serious turn.

A plan was suggested some fifty years ago for arresting the cold fit by applying pressure to the extremities, but this is now out of practice. It is usual in some cases where the cold fit is very severe, to administer a stimulating draught, consisting of half a fluid drachm of spirit of ammonia, a drachm of nitrous or sulphuric ether, and an ounce of camphor mixture, either with or without a

little Tincture of opium. We ought to be careful how we administer stimulants, as by an incautious use of them, we are apt to increase the severity of the hot stage, and give rise to head symptoms, especially if opium be used.*

When the *hot stage* is established, the bed clothes should be light; the apartment freely ventilated; thirst assuaged by refrigerant drinks; cold or tepid ablution of the extremities if the heat be intense; saline diaphoretics may also be administered if necessary. But the most important part of the treatment in this stage consists in attending to local congestions or hyperemia of internal organs; these should they exist must be combated by the application of leeches, or the abstraction of blood from the arm. Much of the success of the case and the after treatment, as well as speedy and perfect restoration to health, will depend in a great measure on the discretion exercised by the practitioner, and the promptitude with which he meets visceral congestions. The existence or absence of these will be manifest by the character of the symptoms present. Cases thus treated stand in contrast to those where blood-letting either local or general was neglected or omitted where imperatively demanded. In the one case, the constitution recovers its vigor with the return of health; in the other, though the individual be to appearance cured, something often lurks in the system, ready to break forth into disease on the slightest disturbing causes. I could give illustrations by cases relating to these facts, but my limits will not permit. I do not as a matter of course advocate the use of blood-letting for the cure of intermittents, the majority of cases as before mentioned usually run their course without much interference or any active treatment being employed. But in practice there occur several cases that become complicated with visceral congestions and cause distressing symptoms, especially when the disease prevails to some extent in any locality: it is in these, where the judicious abstraction of a few ounces of blood has a salutary tendency, by checking the farther progress of the disease, and hastening recovery.

When the *sweating stage* is coming on, or has succeeded to the hot, the bed clothes should be increased with the view of promoting perspiration, but not so as to encourage it to profuseness. Should it be necessary on account of the drenched state of the bed linen, as is sometimes the case, to rub the patient dry and change his clothes, we ought carefully to guard against drafts or currents of air to prevent his being chilled, as any cause operating so as to suddenly check the perspiratory secretion might give rise to serious consequences. Often there is no necessity for officious interference, as the sweating is moderate, and the patient frequently falls asleep at this stage of the disease.

* We believe that Dr. Smith succeeded in arresting the cold stage of ague by inhalations of sulphuric ether—ether administered in this way checked the rigor and shortened the hot stage by superinducing diaphoresis.

Irritability of the stomach which is often a very troublesome symptom, may be relieved by administering effervescing draughts, or draughts composed of one fluid drachm of nitrous ether, and one ounce of camphor mixture, combined or not with five drops of laudanum. If these fail a sinapism may be applied to the region of the stomach. Ice or iced water if it can be procured may be given internally.

2. *Treatment during the intermission.* It has already been mentioned that the patient though to appearance well after the cessation of a paroxysm of intermittent fever, still has the disease lurking within him, and cannot be pronounced cured, until the tendency to periodical recurrence has been obliterated. To effect this object, certain tonic medicines are employed, which experience has proved to be most useful. The principal of these are Cinchona bark and its preparations, and Arsenious Acid. Salicine a crystalline principle obtained from willow bark, and other vegetable and mineral tonics are of less efficacy.

Cinchona bark, called "Bark" by way of pre-eminence, and "Cinchona" (by Linnæus) in compliment to the Countess of Cinchon, lady of the Viceroy of Peru, who is said to have been cured of fever by the virtues of this drug, and was the first that brought it to Europe in 1669, has very justly and deservedly received celebrity as a febrifuge medicine. The term febrifuge given to it is less strictly correct than the term "antiperiodic" also applied to it. The latter is a more correct designation. It would be an error to regard Cinchona as a febrifuge in an unlimited sense. Its curative powers specially so considered are confined to fevers which partake a periodic or intermittent character, viz. Intermittent and remittent fevers. In continued fevers as well as in other diseases, bark is only used in small doses as a tonic remedy during the period of convalescence,—any other vegetable tonic or bitter would answer equally well in such cases.

The varieties of Cinchona of which several exist, are all the produce of the new world (America). This region of the globe is remarkable not only for its mineral wealth, but also for some of the most valuable vegetable drugs employed in medicine. The trees which produce the true Cinchonas are supposed to be confined to the mountain chain of the Andes, within 20° of South latitude and 11° of North latitude. They grow in high elevated positions between 1,200 to 10,000 feet above the level of the sea, the principal being from 6,000 to the latter height. The temperature on average of these regions is from 59° to 62° F. The soil is a micaceous schist. The antiperiodic virtues of Cinchona reside principally in *quina* and *cinchonia*, two alkaloids which exist in the bark in combination with kinic acid, and probably also with a little sulphuric acid; from these the alkaloids may be separated by chemical processes.

To M. M. Pelletier and Caventou of France belong the distinguished merit of having determined in 1820 the alkaline nature of cinchonia, and of having discovered quina and elucidated their properties; they have thus achieved for the physician and placed within his reach, a medicine of most potent virtues.

Previous to the exhibition of Cinchona or its preparations for the cure of intermittent fever, practitioners are pretty generally agreed that the system ought to be prepared for it in some measure. Its administration is contraindicated where there is visceral congestion or inflammation. To prepare the way for the exhibition of so valuable a remedy, an emetic or purgative is administered, sometimes both: blood-letting either general or local should be premised where visceral complications exist. Should there be nothing to prohibit its use, 5 grains of disulphate of quinine dissolved in one and a half ounces of water, its solution aided by the addition of from 5 to 8 minims of dilute sulphuric acid, are given to the patient during the intermission, and the dose repeated as circumstances require: it is recommended that a dose be given about half or quarter of an hour, or even a few minutes before the expected invasion of the paroxysm. Generally two or three doses suffice. It sometimes becomes necessary to give quinine in larger quantities. It is advisable to commence with 3 or 5 grain doses, and increase it if required. I disapprove of the plan of giving large doses at once when not absolutely needed. A slight difference of opinion exists as to the best time for its exhibition. Some advise giving a full dose (10 grains of disulphate of quinine) shortly before the expected return of the cold fit, others administer the quantity of quinine necessary in divided portions during the whole period of intermission. I studied with care the relative merits of both methods, and must confess that the second appears to me the preferable. The medicine has time to prepare the system for resisting a recurrence of the attack, and frequently checks it altogether. When the quinine is deferred being given to within half or quarter of an hour, or a few minutes before the expected time of a return of the paroxysm, it does not invariably ward off the attack, as I have frequently witnessed; two or three days in ordinary cases generally transpire, before the morbid chain is broken through, the quinine being repeated during each intermission. When the paroxysm does occur in such cases, the hot stage is always more or less attended with head symptoms, but the paroxysm itself is of shorter duration compared to the attacks that preceded it. I disagree with those who affirm that quinine loses its effects unless when administered *immediately* before the expected return of the cold fit of ague; my experience does not coincide with such a statement.

In the absence of quinine, or where it cannot be procured, the bark in substance in fine powder should be administered in drachm doses, mixed with a little water, and repeated every hour, or every

second hour during the intermission until about six doses shall have been given. Bark in substance, on account of its bulk when administered in the above mentioned doses is apt to disagree with some stomachs; in others it gripes and exercises a purgative effect, owing to the quantity of ligneous matter it contains. In such cases it should be conjoined with a few minims of laudanum, or a fluid drachm of tincture of capsicum in each dose. The lancifolia variety contains more *cinchonia* than quina; the cinchona cordifolia has a larger quantity of *quina*, being about 12 to 20 grains of this alkaloid in 1000 of the bark, and but very little or no cinchonia, consequently it should be preferred for use. The simple decoction answers very well for a tonic, it does not contain a sufficiency of the active principles of the bark to admit its being administered as a febrifuge to arrest intermittent or periodic disease. It would be advisable where quinine cannot be had to extract the active principles of the bark by the following process. On one and a half ounces of bark in powder put into a white glazed porcelain cup, pour one pint of soft drinking water boiling hot, and add a fluid drachm of dilute sulphuric acid, triturate with a glass rod or clean splinter of bamboo, digest for ten minutes in a sand bath, or over steam issuing from a sauce pan containing water kept boiling, stirring occasionally; strain while hot, and bottle for use. Apportion the strained liquor into three or four doses, shaking the bottle each time when it is used, and let the patient take the whole in these divided portions during the period of intermission. Metallic vessels should be avoided in the preparation. The enamalled saucepans now sold in the Indian market would be extremely useful for the purpose. It would be advisable to supply each Corps and Hospital with a "Berlin digester" for preparing an acid decoction of bark,—one would last a long time with care. By this means we can command all the beneficial effects of the bark, and reject its effete matter. The medicine next in order of importance for the cure of intermittent fever is

Arsenions Acid. That a substance possessing such powerful effects on the animal economy, and serving the purpose of curing distressing maladies to which man is subject, should have been subverted by some of his fellow creatures to the worst and basest of uses is a disgrace to human nature. The substance itself nevertheless continues to hold a place among the articles of the Materia Medica. In consequence of the insolubility of arsenious acid, an arsenite of potass solution is prepared for medicinal use, colored by a little compound tincture of lavender; this preparation has received the popular epithet of "Fowler's solution." It contains four grains of arsenious acid to the fluid ounce, and half a grain in the fluid drachim. Its usual dose is five minims in an ounce of tonic vegetable infusion or plain water, conjoined with five minims of tincture of Opium to prevent griping, which it is very

apt to occasion ; this dose should be repeated two or three times during the apyrexial period. Arsenious acid should not be given in the first instance, its administration is only admissible after other remedies have been tried and failed, or in obstinate cases in the absence of quinine and bark. In a very obstinate case, where the usual remedies were tried without success, viz. calomel, purgatives, bloodletting local and general, and even quinine itself—arsenious acid arrested the disease—the patient became salivated by the remedy ; this is one of the signs of the operation of this powerful medicine. It should be given after meals, and during its exhibition we ought to be watchful of the train of symptoms, and should any thing untoward occur, the medicine ought to be instantly discontinued. It is a great remedy with the natives of India, who not only prescribe it in fevers, but apply it in the form of a paste as a caustic, and it is the principal ingredient in the noted "Tanjore pills," so famous for the cure of bites of the *Cobra de Capello*, so common in India.

How do Cinchona and Arsenious acid operate in curing intermittent diseases ? Is it by any special influence they exercise on the nervous system ? Or is it through some agency unknown to us ? These important questions I must leave unanswered, and pass on to notice briefly some other medicines of less note, employed in the cure of intermittents.

Salicine I shall pass over, as the bark from which it is obtained is not indigenous to this country.

Piperine is a crystalline vegetable principle, of a light yellow color, tasteless when pure ; it is procured from the long and black pepper ; its efficacy in fevers is somewhat problematical.

Narcotin or Narcotina, also a crystalline vegetable principle associated with Morphia in Opium, which contains it in variable quantity, has been administered as a febrifuge, and by some trials made in Calcutta, it was announced as a substitute for the more expensive medicine disulphate of quinine. Recent investigation has not confirmed this statement. It is now pronounced to be inert on the animal economy. I prepared some of this substance in the Laboratory of the Medical School under the direction of Superintending Surgeon T. Key, late Professor of Chemistry, Mr. Harding, late Surgeon of the General Hospital, tried its efficacy in some cases of fevers, and gave it as his opinion, that it had no effect on the system ; this statement corroborates that recorded by Dr. Pereira in his invaluable Elements of Materia Medica.

Sulphate of Zinc in tonic doses has been used with some degree of success for the cure of intermittents in the fenny districts of England.

The natives of this country according to account use the mar-

gosa bark finely powdered, or a decoction made of it, for the cure of agues: also the oil extracted from the seeds of the margosa berries by pressure. The oil is a very noxious remedy. Of the medicinal value of the powdered bark or its decoction I cannot speak with any degree of certainty, beyond that it is a light tonic bitter. The oil is useful as an embrocation in chronic rheumatic complaints. Some attempts made to extract an active principle from the bark in the laboratory of the medical school by late Professor Key were not attended with success.

The diet of patients suffering from intermittent fever should be light and nutritious, moderate in quantity, and taken at a time not too close upon the expected return of the paroxysm. Attention must also be paid to the clothing of the individual. He should avoid exposure to high winds, and night and damp air.

During convalescence, the diet and regimen should be attended to, also the state of the digestive organs. Quinine and other tonic preparations should be continued for some time after the disappearance of the paroxysm. Gentle exercise is salutary and promotes health. The hours of the individual in regard to meals and rest should be regular. He should not for some time undertake to do any thing that may be fatiguing to the body, or any thing that has a tendency to depress the vital energy of the system.

Radical cure of Intermittents.—Do we in reality possess a remedy for eradicating this disease? This question cannot as yet be answered with any degree of certainty in the affirmative. Nevertheless, we ought not to reject without sufficient evidence medicines which, the experience of some medical men has pronounced to be efficacious in removing the tendency to periodical recurrence of agues, and of re-establishing health, even in those individuals who continue to reside in the locality where intermittents prevail. The trials made of the *Persesquinitrate of Iron* in such cases have proved of considerable value in America, according to statement by Surgeon W. Kerr: this medicine is easily prepared, and any medical man can make it for himself without much trouble: the process is as follows:—Take of fine iron wire one ounce, nitric acid three fluid ounces, diluted with fifteen fluid ounces of distilled water; pour the dilute acid on the iron wire (coiled together or cut into small slips) in a suitable glass vessel, (a wide mouth bottle will do), and set it aside for twelve hours in a gently warm place: decant the solution at the end of this time, and add sufficient water to make one hundred and twenty fluid ounces. *Dose* for the cure of ague—one tea spoonful to be taken three times a day for an adult. The value of this remedy in the Intermittents of India remains to be tested. Should it prove so successful, as the trials of it made in America warrant us to believe it will, we shall have gained a considerable triumph in the treatment of agues. On the strength of it, several no doubt would be prepared to penetrate with impunity into the morasses and jungly districts of this country, to ex-

plore the mineral resources of India, sought with avidity by not a few.

ARTICLE II.—*Case of injury of the Brain, in which an iron ferule was found imbedded in the Cerebrum after death.*—Communicated by 2d Apothecary R. HUFFTON.

Private John Williams, Æt. 29, H. M. 51st Regiment L. I., 4 years resident in India.

The subject of the following case was admitted into the Regimental Hospital, on the night of August 8th 1851, in a state of complete intoxication, suffering from a contused lacerated wound about half an inch in length, situated over the right malar bone, with great swelling and ecchymosis of the eyelids. From his inebriated state he could give no account of himself: he only seemed sensible to pain when an attempt was made to examine the state of the wound. The report taken the following morning of his case is as follows:—"Brought into hospital last night, having while intoxicated in Black Town been severely beaten and robbed; there is a lacerated wound in right malar bone, eyelids puffed and swollen, considerable ecchymosis, tongue dry and brown, pulse soft, complains much of intense pain in crown of head."

For a few days after admission no particular change in his state took place, except that the pain at times became less; this pain he occasionally referred to the crown of head or back of right ear; describing it as if the top of his skull were being dragged off: the swelling and ecchymosis of eye were also less, the pupil was dilated, and the cornea appeared glazed, with entire loss of vision.

On the 14th of August the following statement occurs in his case. "Complains very much of pain in crown of head, much swelling of eyelids still, and on separating the lids the pupil is freely dilated, cornea glazed, cannot see at all, not even to distinguish light from darkness, no fever, cannot sleep, Pulse 84, bowels rather confined, tongue furred at base, the right eye is protruded beyond the orbit, and outer half of conjunctiva still chemosed, but less so than yesterday."

Subsequent notices of the progress of the case up to 2d of September state, the recurrence occasionally of intense pain in the crown of head and mastoid process, and the feeling compared to that of a jagged knife being drawn sharply over the part;—there was some slight discharge of healthy pus from the wound in malar bone, the other symptoms were in some measure less, excepting that the skin was dry; the intervals of ease were more frequent, vision was gradually returning, the cornea became transparent, and although the eye was still protruded beyond the orbit, from which a profuse discharge of pus exuded on pressing the lower lid, yet

the protrusion was not so prominent as before; he slept better, and his appetite was good. At midday on the 2d of September the following is a statement of his case. "After breakfast became drowsy, and about midday was comatose, passed a stool involuntarily in bed." On the day succeeding the following entry occurs. "A little thin purulent discharge from eye, which is this morning more protruded, does not complain of any pain, pulse soft, rather small, 84; tongue parched, skin cool, lies in a semicomatose state, pupils inactive."

From this time he gradually became worse, was considerably emaciated, seldom complained of pain, and could with difficulty be roused. He finally sunk at ½ past 6 on the morning of the 7th of September.

The *treatment* consisted in the first instance of the application of leeches and cold to the affected eye, the exhibition of purgatives, tartar emetic in nauseating doses, calomel and opium, diaphoretics and low diet. Subsequently, blisters to the head, opiates to allay pain, belladonna and the wine of opium to the affected eye, scarifications for the escape of pus collected in the orbit, fomentation, wine and liberal diet &c.

Sectio Cadaveris.—11 hours after death.

Cranium.—Dura mater adherent to skull; on dividing it for the purpose of removing the brain, at the posterior lobe of right cerebrum a substance was removed by scissors, and much matter exuded. At base of brain there was considerable serous effusion. The membranes highly congested, presented a dry glistening appearance—On removing the brain, a dark body was observed in the abscess, and proved to be an iron ferule, 1½ inch in length, weighing 5½ drachms, which had passed from the wound of the cheek over the edge of the orbit, and along its floor, without injuring the eye-ball; it had then fractured the orbit posteriorly, and external to optic foramen, entered middle lobe of cerebrum anteriorly, passed through it, and was found lodged posteriorly and inferiorly in posterior lobe: the abscess was upwards of three inches in length, broader in centre than at the extremities, and contained five ounces of pus. In right ventricle there were about two ounces of purulent matter.

Remarks.—This case presents several points of interest. The presence of a foreign body in the substance of the brain without disturbing to any considerable extent the mental faculties of the individual is a rare occurrence in practice. The symptoms in this case though indicating serious implication of the cerebral organs, gave no positive proof that the cranial cavity had been penetrated and that any foreign substance was lodged in it. At the time of receipt of the injury, the man was insensible to pain, owing proba-

bly to the state of stupefaction induced by drinking to excess. The next morning and succeeding days he was unconscious of the nature of the accident. He had the full use of all his senses, was perfectly rational, and answered questions as if no serious accident had taken place; the result was probably that his medical attendants never suspected the existence of an injury to the brain so extensive, much less could they have suspected that a foreign body was lodged in its substance. The most prominent symptom was the intense pain referred to the vertex, which remained pretty constant throughout, with occasional shifting of the pain to the occiput and temples. Another prominent symptom was loss of vision: this might have been attributed to external injury of the eye, which the wound in malar bone, the protrusion of the eye-ball, and ecchymosed state of the eyelids gave reason to suspect. The symptoms on the whole indicated severe congestion of the brain, not inflamation as commonly characterized: there was absence of delirium, picking of the bed-clothes, high fever, contracted state of the pupils, and the extreme sensibility of these to light; the pulse very often was under the average healthy number of beats in a minute. There was discharge of pus from the external wound in malar bone, but this might have taken place from the eye or orbit, and not from any abscess in brain communicating with the external seat of injury, for the existence of an abscess in the brain during the life-time of the individual could at the most have been but distantly inferred. The usual accompaniments of severe injury to the brain are convulsions, which speedily terminate in death. That such was the case in accidents of a similar nature will be seen from three cases given below; but in the case under notice no convulsions occurred. Another point worthy of notice is, the long time the individual survived after the receipt of so severe an injury, implicating so important an organ. In this respect, this case differs materially from the other three cases of a similar kind, whose history are transcribed below. In all four coma preceded death.

These facts show how extremely difficult it is correctly to diagnose disease resulting from injury of the brain, particularly where the injury is concealed from view.—The cause of death having been revealed after examination of the brain, the circumstance was communicated to the Police, four individuals were apprehended on suspicion of the murder, or at least as being concerned in the affray which led to the accident; the clue to detection being a dispute that had arisen among them in dividing the spoils taken from the deceased; one of them being dissatisfied with his share. It then came to light, that a watch which had been stolen from deceased was in possession of one of them—The prisoners were brought to trial at the Sessions in February last, were convicted, and sentenced to transportation for seven years.

[The following three cases of a similar kind, taken from the "Dublin Quarterly Journal of Medical Science" for May 1851 are published—they are interesting when taken in connection with the case here detailed. Ed.]

"*An account of three fatal cases in which an accidental injury to the Brain was undetected during life.*"

"[The following cases are especially interesting as an illustration of the slight evidence which a rapidly fatal injury to the brain may present until a short time before death. In all three there was no idea in the first instance of injury to the organ; and the cause of death was unsuspected until revealed on *post mortem* examination. Their history, too, offers a practical commentary on the necessity of the most careful examination in every case in which, from the position of a wound, or the nature of the instrument with which it may have been inflicted, the brain might possibly be penetrated: we have, therefore, thought that their connected publication would have a valuable contribution to surgical literature.—Ed. *Dublin Quarterly Journal of Medical Science.*]

"Case I.—By George Anderson, M. D., Surgeon 12th Royal Lancers.

"Trumpeter Henry Grainger, aged 30 years, was admitted into hospital on 27th February, 1851; he was seen at the morning visit, at 10 o'clock, by the Assistant Surgeon Dr. George, who found him in bed, and considered that his ideas were somewhat confused, but attributed this, in part, to indulgence in drink the previous night (the 26th), as, on questioning the patient as to what was the matter with him, he said that on the previous evening he had been fencing with a walking cane with some of his companions, and that he had received a blow on the nose, or a thrust from a cane in the face. On examination, a small punctured wound was observed on the left ala of the nose, which did not appear larger than the wound arising from a leech bite; and at this time, though somewhat taciturn, he appeared perfectly sensible, and answered readily the questions put to him.

"Fomentations to the wounded part, and aperient medicines, were the remedies prescribed, and no unfavorable symptoms supervened during that day.

"At the morning visit on the 28th, he was considered as not better, nor as sensibly worse, though there was no doubt that he was at this time labouring under a considerable degree of stupor; yet no alarming head symptoms were manifest, and, consequently, no particular examination of the parts where the wound existed was made, and the only additional remedy prescribed was a cold lead lotion to the head and face, and the purgative medicine was repeated. About 6 o'clock on the same evening I was called by the hospital

sergeant, who stated to me that Grainger was much worse; and though Dr. George informed me, at muster parade in the forenoon, that he could not account for the continued symptoms of drowsiness and stupor in his case, I certainly did not suspect, either *before* or *after* seeing the patient, that there had been any wound of the brain, much less that a foreign body had penetrated to that organ, and was firmly impacted in the patient's skull. When I first saw him this afternoon he was struggling violently with the attendants, who required to use force to keep him in bed; his breathing was stertorous, and he was puffing with his lips; the right eye was fully expanded or staring, and its pupil greatly contracted; ptosis of the left eye-lid existed, and on raising the eye-lid the pupil was found to be extremely dilated. He had passed a large quantity of urine in bed, and his bowels had been open since morning.

"On questioning him, or rather calling him sharply by name, he would raise himself into the sitting posture, throw his arms about, and strike at, or take firm hold of any object within his reach.

"I had considerable doubt and difficulty in determining on the immediate measures to be adopted, the history of the case being to me quite obscure, and the symptoms being urgent and most unfavorable. Though the pulse was not full or bounding, the action of the temporal arteries was exaggerated, and, therefore, looking only to present symptoms, I opened the right temporal artery, and though this was done effectually, I only obtained about a couple of ounces of blood from it. I then opened a vein in the arm, but did not obtain much more blood in this way. A large turpentine enema was then administered, and grain doses of calomel were ordered every hour or half-hour. I left the hospital with very slender hopes that a fatal issue could be averted, and I had not been much more than half an hour in my room when I was called to the hospital, but before I reached it the patient had expired, after a violent convulsion attended with great discoloration of the countenance. The fatal event occurred at about a quarter past eight o'clock on the evening of the 28th of February, 1851; and the features of the deceased appeared calm, and not distorted, when I saw the body.

"The autopsy took place sixty-three hours after death, on Monday 3d March.

"On removing the calvarium the dura mater presented nothing abnormal, but when it was removed a considerable degree of chronic arachnitis was presented, and the pia mater was found to be very vascular. After dividing the falx cerebri the anterior lobes were raised, and, gradually proceeding backwards, we had got as far as the division of the optic nerves, when the scalpel struck suddenly on a metallic point or substance directed obliquely upwards and backwards, and protruding into the cavity of the skull, close to the left side of the sella turcica of the sphenoid bone, and pressing or lying on the left optic nerve, or left side of the optic commissure.

"The cause of the man's death was at once made manifest to myself

and Drs. Carte and George, who were present at the examination, as the foreign body was evidently the brass point or ferule of a small walking-cane.

"I did not proceed further in the examination, but reported the circumstances to the Commanding Officer, when a Coroner's inquest was ordered to be held on the body.

"In the course of the afternoon the Coroner held the inquest, and Surgeon Porter, Jun., was the medical man ordered by him to investigate into the cause of the soldier's death. I was present when Mr. Porter proceeded with the further examination of the brain, and the parts in connection with the foreign body. On probing the nostril the end of a foreign body could be detected, and before it was removed by Mr. Porter from the situation it occupied in the skull, it was evident to all present at the examination that it was the broken end of a cane, of which the ferule or brass point presented itself in the inside of the skull, by the side of the posterior clinoid process of the sphenoid bone.

"Dr. Carte afterwards made a section of the skull, by which the course of the stick was exhibited. The point of it had pierced the left ala of the nose, at the junction of the cartilage with the bone, taking a direction upwards, backwards, and a little inwards; in its course it grazed the middle and inferior turbinated bones, passed through the great cell in the body of the sphenoid, breaking off and carrying before it the posterior clinoid process, and finally impinging upon, but not rupturing the membranes covering that portion of the anterior lobe of the brain in immediate relation to the optic nerve of the left side. Anatomically speaking, there was nothing to oppose the onward progress of the stick, for in fact it passed up the nostril, the only resisting part, after it entered the skin and cartilage, being the body of the sphenoid itself, which, in the present instance, was very slight, its walls affording almost no resistance, in consequence of their extreme thinness.

"It is evident that, while fencing as he had described, the cane had accidentally struck the unfortunate man's face, probably from his own act in parrying the thrust, and that the point of it had entered through the left ala of the nose, passing obliquely upwards and backwards, until it emerged, as described above, by the side of the sella turcica. I should think that the cane had broken off *short* in the nose when it was being withdrawn by his assailant.

"Mr. Porter appeared to be of opinion that the brain presented an inflamed appearance, but this may have been more apparent than real, and may in part be attributed to *post mortem* effects and exposure to the atmosphere, which latter had caused the blood in the vessels to assume a more vermilion appearance than it presented on the morning of the examination.

"There can be little doubt if a detailed and accurate account of this unfortunate fencing match had been obtained at the time of the patient's admission into hospital, and the stick which inflicted the

injury had been produced (which was done after the man's death, and shown to me), that the attention of the medical officer would have been directed to what he, without any further information than the patient's negative statement, considered only as a trivial puncture in the ala of the nose, and would have, undoubtedly, led him to ascertain that there was a foreign body impacted within the nostril, and, probably, passing backward so as to touch the brain. I am inclined, however, to the opinion, that had all the above information been obtained at the time of the unfortunate soldier's admission into hospital, the foreign body might not have been extracted from the situation it occupied in the man's skull, as it required considerable force to drive it with a punch and hammer, from within outwards, in the dead body; and if it had been extracted, the question arises, what chance was there of a fatal termination being averted.

CASE II.—By Sir PHILLIP CRAMPTON BART., F. R. S., &c.

["When we were favoured by Dr. Anderson with the history of the foregoing case immediately after its occurrence, we wrote to Sir Phillip Crampton to request the particulars of a somewhat similar one which we were aware had occurred in his practice many years ago, and, in reply, received from him the following letter, in which they are contained.—Ed.]

MERRION SQUARE.
March 27, 1851.

"MY DEAR SIR,—I have but very short notes of the case of wound of the brain to which you allude, but, such as they are, they are at your service.

"In the winter of 1814 a gentleman of the name of McLoughlin, a Lieutenant in a Highland regiment, when running on a dark night to escape from a shower of rain, came rather violently in contact with an irritable old man, who made a thrust at him with an umbrella, the point of which struck him immediately beneath the left eyebrow. The recontre took place on Essex-bridge; but the wound was attended with so little local pain or shock to the system, that Mr. McLoughlin walked to my house in Dawson street (a distance of at least half a mile), and having mentioned the occurrence, as one to which, however, he attached no importance, he begged of me to look at the wound on the eyelid, which still continued to bleed slightly.

"I found a wound of about three-fourths of an inch in length in the upper eye-lid, exactly in the seat of the deep fold which is formed in this part by the action of opening the eye and looking upwards. When the eye ball was turned upwards there was no appearance of wound, but when the eye-lid was drawn downwards the wound gaped and showed the conjunctiva, which still completely covered the upper portion of the ball of the eye. The vision

was quite unimpared. The wound having been united by two points of suture, Mr. McLoughlin took his leave, and walked to his lodgings in Grafton-street. I called on him on the following morning and found him at breakfast; he made no complaint but of some stiffness in the eye-lid. On the next morning at 7 o'clock A. M., I was called to him in a hurry, and found him in strong convulsions, so strong that it was with difficulty two persons were able to keep him from working himself out of the bed. The convulsions continued with short intervals of coma until 8 or 9 o'clock in the evening, when he expired.

"The *post mortem* examination was made at 10 o'clock on the following morning, by the desire of the coroner.

"It was found that the brass ferule of the umbrella, nearly two inches in length, had penetrated through the orbital plate of the frontal bone, and was lodged in the substance of the left hemisphere of the brain; it was imbedded in a thin coagulum of blood, which extended into the left lateral ventricle; both ventricles contained a small quantity of bloody serosity. A portion of the os frontis, containing the perforated orbital plate, was deposited in the Museum of the College of Surgeons.

"Very truly your's
"PHILLIP CRAMPTON.

"*To the Editor of the Dublin Quarterly Journal of Medical Science.*"

CASE III.—By JOSHUA PAYNTER, Esq., Surgeon of the 13th Light Dragoons.

[The account of this case, which, though not as complete in the details as the two previously related, is yet equally illustrative, has been procured for us through the kindness of Dr. Gibson, Surgeon of the 17th Lancers.*]

"The following case occurred in a soldier of the 77th regiment, in 1842, when I was Assistant Surgeon in the Rifle Brigade; and by the desire of Dr. Burrell, then Surgeon of the 77th, I made the examination after death.

"The Soldier was drunk and put in the guard-room, and the following morning was sent to hospital with some slight complaint, either head-ache or some other complaint not particularly urgent. I think he was in hospital one or two days; and, if I mistake not, after having taken a dose of aperient medicine, was walking about, when, on a sudden, he was attacked with symptoms resembling apoplexy, and died in a few minutes.

* The particulars were given in a letter from Mr. Paynter to Mr. Tuffnel, Surgeon of the City of Dublin Hospital.

"*Post Mortem Examination.*—I must previously state, that there was no external appearance to indicate any injury having taken place. There was nothing abnormal perceived until the dura mater was removed, when, on raising up the brain, a collection of puriform matter was found in the left anterior lobe, and its inferior surface, where it rests on the left orbital plate of the frontal bone, and in it a piece of tobacco-pipe, about two inches in length, was seen penetrating the substance of the brain. The piece of clay pipe was supported by the left eye-ball, having also as a support a circular hole in the left orbital plate; on further examination externally a much ecchymosed spot was found in the upper eye-lid, which proved to be a wound made by the piece of pipe, which had entered the orbit, passed through the orbital plate of the frontal bone, and thus caused death.

"The inference drawn, of course, was, that the man going home drunk with a pipe in his hand, must have fallen, and in the act thrust the tobacco pipe into the orbit and fractured the orbital plate as before stated. No wound was apparent, nor do I think any external appearance of black eye, as the upper lid being drawn up by the levator palpebræ hid the opening from being seen."

PART SECOND.

[We regret being unavoidably obliged to postpone publishing the continuation of Professor Blacklock's Lectures on Medical Jurisprudence. We hope to do so in our next number.—Ed.]

PART THIRD.

MADRAS JOURNAL OF MEDICAL SCIENCE.

Since the publication of the last number of this journal, a change has taken place, in consequence of the retirement of Mr. Flynn from the editorial management. Its present conductor, and late co-editor, will relax no effort to make the journal generally useful and worthy of support. The chief object of this periodical is to sustain the interests of the subordinate medical department; and this point will be steadily kept in view. Our fellow members of the profession must bear in mind, that to gain so

desirable an end, much will depend on themselves. There must be a general effort, a consentaneousness of action, an energy from the body in its entirety. All ought to give the journal a helping hand as far as in them lies. Nearly every one composing the ranks of the subordinate Medical department, has it in his power to contribute to its support by subscribing for a copy: a considerable number in addition to subscribers, have ability enough to furnish us with articles for publication in its pages. It is by so doing alone we can expect to give proofs of our intelligence, and exhibit to advantage the opportunities we have had of reading, and of the professional experience we have acquired in the great field of disease. Those desirous of favoring us with articles for publication (of which we at present stand in great need), will be good enough to forward them "*post paid*" to the address of Mr. J. Stanhope the Proprietor, by whom all communications will be received. We have pleasure in stating that we have the hearty good wishes of many for the continued prosperity of our undertaking, but good wishes alone without personal exertion on the part of those for whose interest this journal is especially intended will beget little good. We trust, therefore, that the members of the subordinate medical department generally, will see the necessity of taking an active part in upholding a periodical, the success of which cannot but be productive of good to the department.

The substitution of "fish liver oil" as a medicament for the more expensive article "cod liver oil" imported into this country has of late excited much attention. The oil prepared by Mr. Gay, and which goes by his name, is said to be obtained from the liver of fish which abound in the Indian seas. In an editorial notice in the third number of this journal (page 164), mention was made in confident terms of the success as a therapeutic agency, of oil prepared from the liver of the skate fish. We are ignorant of the fish from the liver of which Mr. Gay prepares his oil, and are equally unacquainted of the source from which the oil recently tried in the Government hospitals was procured. Of the efficacy of the oil obtained from the liver of the skate fish there cannot be a doubt, for it has the same chemical composition, at least in respect to the quantity of iodine as cod liver oil. Its use as a medicinal agent was recognized and established in European practice before the subject excited attention in India.

A point of interest to the Indian practitioner is, the substitution of an artificial "*iodised oil*" for cod liver oil. In a report made to the Academy of Medicine in Paris by M M. Gilbert, Ricord, Souberian and Giubort, who considered this subject at some length, the reporters came to the conclusion—1. that the artificial iodised oils prepared according to the formulæ of M M. Personne, Deschamps, and Marchal, are medicaments of great value in the art of curing. The claim to the priority of having introduced this medicament into practice is ceded to M. Marchal. 2. The quantity of iodine contained in the cod liver oil, appeared in the opinion of the Committee, to be much too small to "attribute to it any considerable part in the action of the medicament." 3. that pure and filtered cod liver oil does not appear to contain phosphorus,—that this body may therefore be considered as foreign to the action of the oil.

A medicated oil prepared by the addition of a few grains of iodine to a quart of gingly oil, has been used by Professor Blacklock at Madras, in the absence of Cod Liver Oil, and as far as we can learn, this vicarium has met with equal success; the members of the profession generally however are not agreed on this point. It would be well to set this question at rest, which we think can be done, by preparing a large quantity of iodised oil, according to the process devised by M. Personne, to which mode of preparation the reporters to the academy gave the preference, and by giving the oil so prepared a fair trial in the public hospitals of the Presidency. Should it succeed, the Madras public could then be supplied with a cheap article, equally efficacious, and much less expensive than the Cod Liver Oil. We wish Mr. Gay every success in the sale of his new medicament, and hope that his enterprising efforts will meet with due support.

We have placed among our selections the report to the Academy above alluded to.

We are glad to mention that this journal has been favourably noticed by the Editor of the *Lancet*. He remarks on the first number as follows:

"This is the first number of a new journal to be published bimonthly at Madras; it is exceedingly creditable to the Editors.

* * *

"The chief contents of the present number are, an able article on Intermittent Fever, by Assistant Apothecary G. Norton, and on the Blood in Health and Disease, by Assistant Apothecary R. Prince; there is also an Introductory Lecture on Medical Jurisprudence, by Professor A. Blacklock. There are some judicious Editorial remarks, and a mass of miscellaneous selected matter. We heartily wish the new journal success."—*Lancet, January* 10, 1852.

We are informed that Assistant Apothecary E. Avery, and 2nd Dresser F. Appavoo, No. 212, have had each a silver medal adjudged to them as prizes, by the Medical Board, for their essays respectively, on Intermittent and Remittent fever, and Rheumatism. We congratulate these individuals, and the department generally, on this stimulus to exertion.

PART FOURTH.

SELECTIONS.

PHYSIOLOGY AND ORGANIC CHEMISTRY.

LECTURES ON DIGESTION, RESPIRATION, AND SECRETION.

GIVEN AT THE ROYAL INSTITUTION, TO THE MEMBERS AND TO THE PUPILS OF *St. George's Hospital.*

BY H. BENCE JONES, M. D., F. R. S.,
Physician to St. George's Hospital.

(Continued from page 188.)

ON FLESH.

In my last lecture, gentlemen, I showed you that plants collect inorganic substances, for the purpose of forming organic compounds, of which their structure is composed. I stated to you, not only the chemical law, but the equally important mechanical law regarding the food of plants. You will remember, that the chemical law was, that around the plant every element which exists in the plant must be present; and that

the mechanical law was, that these elements (must not only be present, but) must be in a fine state of division. The object of my present lecture is to show that the same four classes of substances which exist in plants, exist also in animals, viz., the albuminous substance, the non-albuminous organic matter, the salts, and the water. Whether you take milk, or meat, or vegetables, the same four classes of substances will be found in the one as in the other. I shall also show you, that in the food of animals, the same mechanical law must be satisfied as we found was necessary to be satisfied in the case of the food of plants; that is, that it must be capable of a fine state of division, otherwise it cannot serve as the food of man.

First, then, the chemical law is, that all the elements of which the body is composed are present in the food. To establish this, we clearly must know what is the chemical composition of the animal. It is difficult, though it has been done with very small animals; and it is unnecessary to take the ultimate elements and proximate constituents of the animal as a whole. Instead of taking a whole field for the analysis of a soil, we take only one portion—a portion which fairly represents the whole field, and from this we arrive at the composition of the field as a whole. So also as regards the animal. I shall take for this hour flesh, as the representative of the body. I might—and I shall on another occasion—take blood also as the representative of the body, and show that it likewise contains the same four constituents which we find in the flesh.

A piece of flesh or of muscle may be deprived of its water, as you see here, by drying: and water is one of the four classes of substances existing in vegetables. It may also be deprived of its fat, another of these classes. In addition to this, we find, if we burn the flesh, that there remains an ash, (the composition of which I shall mention in a few minutes,) forming a third class of substances existing in vegetables, and throughout all nature; and lastly, we get from the flesh the highly compound albuminous substance, the analysis of which closely approximates to the analysis which you see in this Table;—

NITROGENOUS ORGANIC SUBSTANCES, ANIMAL AND VEGETABLE.

	Albumen.	Fibrine.	Glutin.	Caseine.	Legumin.	Protein.
C	548	546	552	550	541	550
H	71	70	72	71	71	71
O	212	220	218	217	226	219
N	159	157	151	158	158	160
S	7	4	4	4	4	0
P	3	3	3	0	0	0

These, then, are the four substances which we find in every portion of flesh that comes before us. The determination of the actual proportion of

the elements in the flesh—the making, as it is called, an organic analysis of the flesh, burning it in a combustion tube, and oxidizing it to the last degree, is of the least possible importance. Yet when we so subject flesh to an organic analysis, we always find that carbon, oxygen, hydrogen, and nitrogen are present. The proportions vary with the quantity of fat; they vary also with the quantity of water, and, of course, with the quantity of ashes present. You have all seen the above numbers given in many physiological books representing the ultimate elements of muscle. Such an analysis, I repeat, is of the very slightest importance; still, it is necessary to dwell upon it for one moment. It is no more than if you were to ask me for a description of this house, and I were to tell you the proportions which the different materials—the bricks, mortar, wood, and stone—bore to one another. You will see, that from such a statement you would get but little knowledge of this house; you would merely have the proportions, and these might be as true for a very small house as for a very large one. The relative proportions, then, of the different constituents of the body is of comparatively little moment. It is some knowledge, and, as far as it goes, it is good knowledge; but it is by no means that knowledge with which we can be at all satisfied. Of far more value is it to take the different parts, and determine what the various reactions and changes which you can effect upon them may be.

As the simplest case, let us see, first, what is the action of water upon muscle or upon flesh. Professor Liebig, in his work on Flesh,—that work which is the most admirable specimen of the importance of chemistry, in giving us a knowledge of animal organic substances,—has furnished us with an excellent statement of the action of water upon flesh;—

In 100 *Parts of Beef.*

Soluble in Cold Water	60	Coagulated by Boiling	29·5
		In Solution	30·5
Insoluble in Cold Water	170	Fibre Vessels, &c.	164·0
		Gelatine	6·0
Fat	20		
Water	750		
	1000		

If we take 1000 parts of beef, treated with cold water, we find that only 60 parts are soluble. (A specmien of beef so treated was exhibited.) The residue is made up thus:—Insoluble in cold water, 170; fatty matter, which might be got out by treating it with ether, 20; water, which might be separated by drying it to the last degree, 750. This is the simplest reaction I can bring before you. We have seen that 60 parts only out of 1000 are soluble in cold water; now, how are these 60 parts made up?

Of what do they consist? If I heated this cold extract of beef up to boiling, I should find that nearly 30 parts separated, and 30 remained in solution. Let us look now to the composition and nature of the part which is insoluble in cold water. We know that it contains fat; and we find, also, if we treat it with boiling water, that we can get a quantity of gelatine. Out of 1000 parts of muscle, the quantity of gelatine will be 6 parts only. We come, then, to this conclusion regarding the substances that exist in meat; that if they are treated with boiling water,—in fact, if I try to make beef tea, I should get the substances which are soluble in boiling water, clearly not that which is coagulated at a boiling temperature; that would be lost, whilst the residue, which is soluble in cold water, would remain in solution still; the gelatine, which is soluble in hot water, and not in cold, would be dissolved also; the fibre and the vessels which exist in the flesh would remain undissolved. Thus you would get no more than 36½ parts out of 1000 in solution by boiling, and all the rest would consist of fat, of fibre, and of coagulated substances. (The residue of a quantity of beef-tea was exhibited.)

Out of 1000 parts of beef I get no more than 36 parts by treating it with boiling water. Six of these are gelatine; what may the other 30 consist of? It is found that they consist of many different substances; but before I enter minutely into a description of them, I must say a few words more regarding the albuminous principle and the fibrous principle. The fibre of the muscle can be separatad either by cold water, which gives it free from albumen, or by hot water, which gives it mixed with albumen, coagulated by the boiling temperature. This albumen is very similar to that which exists in plants. The fibrous matter has been called the fibrine of muscle; and this name fibrine, or fibre, has led to a very considerable confusion regarding these substances. Being called fibrine, or fibre, it has been thought to be similar to, and indeed identical with, the fibrine that exists in the blood. I have here a specimen of the fibrine as obtained from the blood, and here the fibre from a beef-steak, washed until it is free from colour. In a late paper, Professor Liebig concludes that the two kinds of fibrine are not identical, and, indeed, are not similar bodies at all. The fibrine, or muscle-fibre, (for fibrine is a bad name to give it,) differs from blood-fibrine in being very soluble indeed in dilute hydrochloric acid. Water, containing only one-tenth per cent. of hydrochloric acid, quickly dissolves this muscle-fibre; but it acts very slowly, if at all, upon blood fibrine. Here is clearly a great difference, an important difference, for the purposes of digestion. After the action of dilute acid on the fibre of the muscle, it may be filtered slowly. (Specimen exhibited.) When this is filtered, the liquid, when neutralized, is coagulat-

ed to a thick white gelatinous mass, easily soluble in excess of alkali. The precipitate also is soluble in lime-water, and when boiled it yieldsa coagulum like the solution of albumen. In these respects the action of the flesh-fibre differs much from the action of the blood-fibrine. The muscular fibre is found in very unequal quantities in the flesh of different animals. The composition of the flesh-fibre differs, indeed, but slightly from that of the blood-fibrine. The muscle-fibre approaches more nearly to the analysis of albumen. It does not contain quite so much nitrogen as the blood-fibrine. Blood-fibrine contains more nitrogen than muscle-fibre. In these important respects the two substances are decidedly different.

Another very peculiar and interesting substance of an albuminous character is, by boiling, separated from the muscular fibre. I find that the hot solution of meat does not consist merely of gelatine and salts, but that it also contains distinctly dissolved in it a portion of albuminous substance, closely approximating to the constitution of albumen, but very different in its chemical reaction. I have here a portion sufficient for my purpose; the flesh has been simply boiled, and then filtered. It may be seen that the substance which filters through, when tested as one ordinarily tests for albumen, will give no apparent indication of the presence of albumen at all. I may heat it to the boiling temperature, and add nitric acid to it, and I get no precipitate—which you know is totally different from the ordinary action of albumen; but after boiling, with the addition of nitric acid, the liquid becomes more yellow—it decidedly changes in colour—and then, if you cool it, a distinct precipitate takes place, which bears the closest resemblance to the substance known as the tritoxide of protein of Mülder, or the *Albuminose* of the French chemists—this substance I met with in large quantities in a case of disease, and it occurs in small quantities in inflammatory blood and in purulent matter. This substance may be easily detected. It differs from the albumen in being soluble in boiling water, not being precipitable in nitric acid in a boiling state, but yielding a precipitate when cool, which redissolves when heated. This forms one of the nutritious substances of the hot extract of beef, or any other flesh. This albuminous substance contains more oxygen than is found in albumen, and perhaps it is best called albuminose. If beef-tea be kept boiling for a considerable time, this soluble albumen undergoes a change, and passes into an insoluble substance which forms a slight scum on the surface of the boiling fluid.

Then there is another most beautiful substance, which exists in the cold or hot solution of muscle. This was discovered by Cheverul, and he named it "kreatin." For this substance we have to thank, in these latter days, Professor Liebig. Berzelius himself could not find it. Pro-

fessor Liebig has now rediscovered it, by acting on large quantities of meat. I have here probably between five and six ounces of kreatin, belonging to Dr. Gregory of Edinburgh, through whose kindness I am enabled to show them to you now. This substance can be obtained from any flesh, if you use quantities large enough for the purpose. These specimens are, perhaps, the most magnificent that have been ever formed; as much as three or four hundred pounds of flesh was actually employed to produce them.

Kreatin, in composition and properties, is closely related to the alkaloids.

Kreatin	$C_8\ H_9\ N_3\ O_4$
Kreatinine	$C_8\ H_7\ N_3\ O_2$
Sarkosin	$C_6\ H_7\ N\ O_4$
Inosinic Acid ...	$C_{10}\ H_6\ N_2\ O_{10}\ HO$
Inosit	$C_{12}\ H_{12}\ O_{12} + 4\ HO$
Latic Acid.....	$C_6\ H_5\ O_5\ HO$

One part of kreatin is said to exist in 1400 parts of flesh. More kreatin is said to be found in thin flesh than in fat meat. Fish (the source whence Dr. Gregory has obtained these specimens) contains most kreatin. Six pounds of human flesh gave to Schlossberger, a German chemist, thirty-one grains of kreatin. In Paris, very lately, a chemist told me that he used a whole horse, with a hope of getting a magnificent specimen of kreatin; but, unfortunately, he did not obtain a grain—probably from using too great quantities of flesh at once, which led to the decomposition of the whole substance. Dr. Gregory tells me, under similar circumstances, that the flesh he used, if standing a long time—if the process was not conducted briskly, and brought soon to a termination—gave a strong urinous and fæcal odour. The mode of preparing this kreatin is a simple one. The flesh is finely divided, and then pressed with water, and the coagulable matters are separated by severely heating them up to boiling. The fluid is then filtered, and the albumen thus separated. Salts are precipitated by baryta, which are separated by filtration. The liquid is then put in flat dishes to crystallize, and kreatin is the result. This, at the present time, is perhaps one of the most interesting substances which organic chemistry has made known to us. We find that kreatine is a substance which undergoes very peculiar and very remarkable changes. If, for instance, we treat it with strong acids, which can take away water from it, it gives an alkaloid,—a substance which had been named by Professor Liebig *kreatinine*. If I take from kreatin two equivalents of water, I get kreatinine as the resultant,—a body which has an alkaline reaction, and which, in fact, acts as an alkaloid. If I treat kreatin with baryta-water, two equivalents of water are

taken up, instead of kreatinine I get the body well known to you as *urea*, which forms the most remarkable constituent of urine, and a body which Professor Liebig calls *sarkosine*, another crystallizable principle. If I treat the sarkosin in a similar way, I get lactic acid, ammonia, and water; or as shown thus.—

$$\left.\begin{matrix}\text{Kreatin} & -2\ \text{Water}\\ C_8\,H_9\,N_3\,O_4 & -2\,HO\end{matrix}\right\} = \left\{\begin{matrix}\text{Kreatinine}\\ C_8\,H_7\,N_3\,O_2\end{matrix}\right.$$

$$\left.\begin{matrix}\text{Kreatin} & +2\ \text{Water}\\ C_8\,H_9N_3\,O_4 & +2\,HO\end{matrix}\right\} = \left\{\begin{matrix}\text{Urea} & +\text{Sarkosin}\\ C_2\,H_4\,N_2\,O_2 & +C_6\,H_7\,NO_4\end{matrix}\right.$$

$$\left.\begin{matrix}\text{Sarkosin} & +2\ \text{Water}\\ C_6\,H_7\,NO_4 & +2\,HO\end{matrix}\right\} = \left\{\begin{matrix}\text{Latic Acid} & +\text{Ammonia} & +\text{Water}\\ C_6\,H_5\,O_5 & +\,NH_3 & +\,HO\end{matrix}\right.$$

All these substances can be produced by the changes which this kreatin can be made to undergo. It appears to me that this kreatin is not, as Professor Liebig thinks, a nutritive substance serving for the nourishment of the body, but that it represents the first substance in the descending scale, the first substance formed before the muscle passes out, (after having served the purposes of life,) by the kidneys, the skin, or the lungs. It seems to be the first of those substances—of which I shall have to give you a long, long series before I end these lectures—which result, by lower and lower degrees, from the highly complex albuminous principles which exist in the different tissues of the body. Possibly I shall not make myself very clear on this point, until I come to a future lecture on the excretions. At present, however, you must take this as my opinion, that I consider kreatin is not a substance which is nutritious, but that substance which is formed in the process of the changes which take place in the muscle previously to its being ultimately removed to enable fresh muscle to be formed in its place to serve the purpose of life. It closely resembles *thein* and *caffein*, of which I have an analysis here for the purpose of comparison:—

Thein and Caffein.

$$\left.\begin{matrix}\text{Carbon} & \ldots\ldots 498\\ \text{Hydrogen} & \ldots\ldots\ 53\\ \text{Oxygen} & \ldots\ldots 160\\ \text{Nitrogen} & \ldots\ldots 289\end{matrix}\right\} = C_8\,H_5\,O_2\,N_2$$

1000

It is not identical in composition, but it approximates sufficiently to justify my bringing the resemblance before you. Thein and caffein, which are produced out of tea and coffee, are identical in composition. It would be most interesting to determine the effect of kreatin as a medicine. Lehman states that thein, when taken, produced on himself palpitation, increased quickness, irregularity, and intermission of the pulse, oppression of the

chest, pain in the head, loss of sleep, congestion of brain, and even symptoms of delirium; and this when it was taken in small doses of not more than from four to two grains. But from other experiments I have heard of, in England at least, this substance does not seem to produce such potent effects.

If the mother liquid out of which the Kreatin crystallizes in flat dishes, is mixed with alcohol, it becomes milky, and a substance known as *inosinate of potash* is obtained. In the flesh, this inosinic acid exists with kreatin; and it is possible that these are the substances out of which urea and uric-acid are formed. Dr. Gregory tells me that he obtained the inosinic acid from the flesh of fowls chiefly, and especially from the turkey. At present he cannot detect it in beef. He doubts, indeed, its presence in beef or horse-flesh. Thus much, then, for the nitrogenous substances which exist in flesh. I must not dwell longer upon these in this lecture.

I must now pass on to the second class of substances, called *non-nitrogenous*. Professor Scheerer of Wurzburg, has shown that flesh always contains a peculiar sugar, not capable of fermentation; and this sugar he has called, from its origin, *inosit*. It differs from ordinary sugar, in having more water. I have given its analysis above. It very closely resembles in composition sugar of milk. The relation of muscle-sugar and milk-sugar I shall have occasion to bring before you, especially in my next lecture. The sugar which exists in muscles if the muscle has been left standing for a long time undergoes a change. Berzelius first, and latterly Professor Liebig, stated generally of all flesh, that it has a decidedly acid reaction. This acid reaction it is not at all difficult to make clear to you. If I test this liquid which is pressed out of beef, you will see it shows a strong acid reaction. (Experiment.) You may say it is coloured with blood, and that you see more of the red blood than of the acid reaction. This a fair objection, but it is not a true one; for if I take flesh which contains no red blood, I find the same reaction as in the flesh which is colored. (An experiment was made on the flesh of a sole.) This sole has been dead a few hours; and this is of some importance, for I find that when flesh is perfectly fresh —when, for instance, in an amputation case a limb has been removed, and a portion of the muscle immediately examined, I do not find the acid reaction so apparent, as it is after the muscle has been removed for some time, If I take this fish which was living a few minutes ago, and examine it in the same way, the reaction will not be anything like so strong as in the former case. The acidity goes on increasing from the time of the animal's death, until putrefaction begins; very probably the acidity is closely related to Professor Scheerer's

sugar, and this sugar undergoes changes from the death of the muscles, and ultimately furnishes the highly acid substance, *lactic acid*. This lactic acid, on which the acid reaction depends, was long since stated by Berzelius to be an ingredient in the flesh; this was doubted by Professor Liebig, who, however now has proved that it is present in large quantities. It exists in the solution of beef-tea; it is soluble in water. You see here some lactic of lime obtained from muscle; it is as distinct as that which is obtained from milk which has become acid. The two substances differ in some properties. Lactate of lime from muscle contains less water than lactate of lime from milk; they differ also in the solubility of the salts. The composition of the two lactic acids is the same. We have then sugar and lactic acid present in the flesh; and, in addition to these, we have fat which is present in every portion of flesh. Scheerer, moreover, has obtained from flesh the same volatile fatty acids as I shall have occasion to show you can be obtained from butter.

Having brought to your notice the nitrogenous and non-nitrogenous organic substances, I must for a few moments dwell upon the salts of flesh.

	Ash in 1000 Parts of		
	Flesh.	Blood.	Milk.
Chloride Potassium ...	...	...	1418
Chloride Sodium ...	147	3616	474
Soda	486	2708	696
Potassa	3995	1066	2346
Lime	180	177	1734
Magnesia	388	73	220
Oxide of iron ...	100	684	47
Phosphoric Acid ...	4674	721	2804
Sulphuric „ ...	30	42	5
Carbonic „ ...	...	794	250
Silica ...	...	119	6

You see here the salts in flesh and in blood; I might also have shown by way of comparison, the salts present in vegetables, which you would find are very nearly the same. The inorganic or mineral constituents in the flesh are very nearly the same as those present in the plant. There is a remarkable quantity of potash existing in the muscle; there is iron also present, magnesia, lime, phosphate of lime, and phosphate of potash in considerable quantities. Professor Liebig has pointed out the remarkable fact, that very much more potash exists in the muscle than in the blood and that much more soda exists in the blood than in the muscle.

Lastly I come to the water present in flesh.

100 Parts of				Water.
Beef	contain	...	...	74
Veal	,,	...	...	75
Mutton	,,	...	...	71
Pork	,,	...	...	76
Chicken	,,	...	...	73
Cod	,,	...	...	79
Haddock	,,	...	...	82
Sole	,,	...	...	79

In addition to these four great classes of substances there are of course present in the flesh the elements of the blood which are circulating through the vessels; there are also the elements of the nervous matter existing in the nerves of the muscle, and there is the cellular tissue which binds the whole together. If, instead of the flesh, I had taken the nervous or bony structure, though the proportions would have been different, yet the same four classes of substances would have been present. Take the nerve for a moment. We have in it a quantity of fatty matter, albuminous matter, a quantity of salts, and a quantity of water. In my lecture on the blood, I shall show you that the same classes are present there also. What is true of the flesh and blood is true of every part of the body. The building materials of which we are made do not consist of only one substance. The plastic substance is not the albuminous matter alone; the albuminous substance is not the only plastic element of the body. Each portion consist of albuminous substance, fatty matter, salts, and water. Of these together, though under different arrangements and varying quantities, the flesh, blood, nerves, bones, and tissues of the animal are composed. The albuminous substance is not more nor less necessary than any other substance among the building materials of the body. The water, the salts, and the fatty matter, are just as essential, and the building could not take place without them. Even if water was absent, the flesh could not be built, for there would be no circulation through it, there would be change taking place; in fact without water, muscle could not exist. If animals, like vegetables, could from the more simple compounds prepare the higher compounds of which their textures consist, then the animal creation would not be dependent on the vegetable creation for its support. But man cannot live on carbonic acid, water, ammonia, and salts; he requires that all the elements existing in his body should be brought to him in a collected and combined state—collected and combined to proximate compounds; and it is in these compounds that the chemical and mechanical laws which as true as regards the food of

plants must hold good for animals; that is, that very substance existing in the body must be present in the food, and not only so, but must be capable of being divided as minutely as possible. If man feeds on animal food, from what I have been saying of flesh, it is quite clear that the chemical law of food is satisfied, as every substance of which the man is made is there. But if the mechanical law is not complete, the food is not fit for him. The great object of cookery is, or rather should be, to fulfil most completely this mechanical law. Cookery is not requisite for the purpose of bringing together the different classes of proximate bodies of which I have been speaking, for they are united by nature; but cookery is of the greatest use in promoting fineness of division; art can there do more than nature. The importance of cookery cannot be overrated. The most refractory substance can, by art, be made capable of being finely divided. In rendering substances minutely divisible, mechanical action is highly important. Not unfrequently chemical action may also be employed to assist this mechanical force. It will be necessary, therefore, to consider what chemical changes the proximate constituents of food can undergo out of the body, and then we shall better understand the changes that take place in the food when it enters into the body. But previously, in my next lecture, I must take milk, the universal food, which requires no cookery whatever; and I must show you how the chemical and the mechanical laws are satisfied in the food of young animals. We shall find that here also, as in flesh, all the elements of which the body is composed are present, just as we saw that all the elements of which the plant was composed had to be present in its food to enable it to grow.

Let me once more mention, that there is this important difference between the food of plants and the food of animals,—that the plant can live on binary compounds, whilst the animal requires complex organic mixtures. All the elements must be present in the binary compounds on which the plant feeds, and all the elements of the animal must be present in the organic substances of which its food consists. The same mechanical law also must be fulfilled in both, for, in order to enter into the organic structure, the food of animals and plants must be finely divided. Without this it cannot enter into the circulation of man, and, even if it could, unless it was capable of being finely divided, it would be impossible for it to form the structures of the body, or, after serving the purposes of life in them, to pass out of the body and enable growth and repair to take place.—*Medical Times, April 5*, 1851.

ON THE PHYSICAL DIAGNOSIS OF DISEASES OF THE ABDOMEN.

By Edward Ballard, M. D.

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[*Continued from page* 177]

Physical signs derived from Palpation in disease.

A. Signs having reference to the abdominal wall.

1. *Increased resistance and apparent thickening.*
2. *Diminished resistance and apparent thickening.*
3. *Increased tension and elastic force of parieties.*
4. *Diminished tension and elastic force of parieties.*

These four signs perceived by gentle pressure with the palmar surface of the fingers, occur as indications either of disease in parieties themselves, or in connection with altered physical conditions of the peritoneum and organs of the abdomen. There must be a distinction, however, drawn between these signs of resistance and tension arising from physical causes, and those which are due to muscular action, either originating in fear, or as the involuntary result of painful disease in subjacent organs. The peculiar, hard, board-like feeling arising from this source, and its evident limitation in some cases to the course of certain muscles, or to one side, as well as its subsidence on steady and gently applied pressure, especially where the attention is withdrawn to other matters, readily distinguishes it.

5. *Tumours in the parieties* are to be felt by sliding the hand with gentle pressure over the surface of the abdomen.

B. Signs referable to internal organs and parts.

1. *Perception of organs beyond their natural limits.*—Palpation can only give this information respecting those organs whose structure fits them for resisting the pressure of the hand, and whose forms and connections are such as to be distinctive. In seeking the definition of the limit of any organ, it is well to commence our palpation at a part to which it is unlikely to have extended, and to approach by degrees its supposed limits. By this mode the spot at which resistance commences is readily perceived, often much more readily than its point of termination, by examining in the other direction. In some cases, where the wall is lax and atonic, as after the operation of tapping, the fingers can be made to embrace more or less any solid body within reach, so as to determine its size and boundaries with the greatest accuracy. When there is much fluid accumulated in the peritoneum, the ordinary mode of feeling for internal organs cannot

be adopted, and in such cases on applying the fingers to the surface, and then suddenly pushing inwards with them, solid bodies may often be felt to strike against them. The possibility of doing this is of itself a sign of the presence of liquid between the wall and the organ felt. The extent, and even other points respecting the liver, spleen, and abnormal tumours, may often be determined in this manner. Organs are perceived by the hand beyond their ordinary limits, both when they are simply displaced, and when they are actually enlarged.

2. *Alteration of form* is perceived by the hand made to pass over the surface of an organ and around its boundaries. In the case of the liver the position and depth of the interlobular notch and thickness of its edge are to be observed.

3. *Irregularity of surface* may occur without alteration of general form; careful palpation of the margin of an organ, or causing the abdominal wall to slide in a circular manner over its surface, will enable the hand to perceive minute amounts of unevenness.

4. *Consistence.*—Some idea of the degree of *hardness* or *softness* of felt organs may be obtained by the sense of resistance or yielding which palpation imparts to the fingers.

5. *Immobility* is a sign which pertains both to the abdominal parieties and to felt organs in certain pathological conditions. In the former case, though the skin and looser portions of the wall may be moved by the hand, yet the deeper portions appear fixed, and cannot be made to slide over the internal structures. In testing the mobility of solid organs, we may either employ gravitation, by altering the posture of the patient, or endeavour to move the organ with the hands.

6. *Increased weight* of solid organs may be appreciated by the amount of force required to move them, or to sustain or raise them, when, by altering the posture of the patient, they are made to rest in some degree upon the hand.

7. *Tumour.*—Palpation of the abdomen may make evident the presence of more or less circumscribed *resistance* in unnatural situations. This, indeed, is a sign which belongs both to displaced and enlarged solid organs, but it is convenient to consider it also apart from these, as a sign of disease in parts which do not offer a sensation of solidity on palpation of the abdomen in health: such are the hollow organs and the peritoneum. The examination of a tumour should include every point which is to be determined in regard to natural solid organs,—its locality, size, form, superficial irregularity, consistence, mobility, and weight, and in addition to these its depth from the surface, and apparent connexions.

8. *Sense of distension.*—The hand being placed on the abdomen, an elevation of the spot may sometimes be perceived to occur, that portion of the wall being raised by the distension of a subjacent intestine with gas.

9. *Sense of subsidence* occurs as the converse of the former sign, but also may appear by making pressure over certain tumours.

10. *Gaseous vibration* is a term which may be applied to sensations which are imparted to the hand when, either during the presence of borborygmi, or on pressure, gas is made to pass through an inefficient space from one portion of intestine to another. The sensation may be one of a croaking character, or it may be bubbling or *gurgling*; in most cases these sensations are accompanied by sound audible at a short distance from the patient. The gurgling vibration indicates the conjoined presence of liquid matters.

11. *Sensation of friction.*—This is referable to a want of smoothness in the opposed surfaces of the peritoneum. It has been variously described as "a soft, creeping, or gentle vibration under the hand," as like the sensation given to the "finger rubbed over a frame of glass." The more intense degrees have been likened to "creaking," "crepitus," and "grating." It is usually perceived during the movements impressed on the abdominal organs, by the action of the diaphragm in respiration sometimes being limited to the inspiratory act. In other cases the pressure of the hand is necessary to elicit it. It rarely arises independently of one of these sources of motion, but has been observed in connection with the peristaltic movements of the intestine alone. It then corresponds in character with these motions; being "continuous," "creeping," and "rustling." The phenomenon is more marked, and less dependent on artificial pressure, where it occurs over the seat of solid organs, or abnormal growths and thickenings, than where it is due simply to a roughened state of peritoneum of otherwise healthy intestines. The friction which accompanies the peristaltic movements must not be confounded with the sensation arising from the passage of gas.

12. *Grating* is only perceived on motion being parted by the hand. The sensation is similar to that of pressing together a number of small hard bodies in the hand, and it is always a sign of a similar accumulation within the abdomen. It is mostly discovered in the regions of the gall-bladder and kidneys; sometimes, however, it is referable to accumulation of hard bodies in the intestinal tube.

13. *Fluctuation.*—To perceive general abdominal fluctuation, one hand should be laid evenly upon the surface while an opposite part is sharply

tapped with the fingers of the other. The sensation given is that which would be naturally referred to the impulsion of a series of waves upon the hand. The fineness of the undulations will depend on the tenseness of the wall, and in some degree upon the thin character of the contained fluid. It is difficult to perceive fluctuation where the wall is loaded with fat, where the peritoneum is greatly thickened, or where there is much infiltration beneath the integument. In the latter case acupuncture will often reduce the thickness of the wall so as to allow of this sign being ascertained. An infiltrated state of the wall itself gives rise to a kind of fluctuation, especially when light manipulation is employed and the wall struck obliquely. The interval of the time which elapses between the stroke and the sensation of fluctuation varies with the thickness of the fluid and the flaccidity of the wall, the latter being modified not only by the quantity of liquid present, but also by the amount of gaseous intestinal distension. Where the quantity of fluid is small, it has been recommended to apply the two hands to the surface to be examined, separating them only by an interval of two or three inches, in such a manner that the two under edges shall be parallel, and can front one another by their external edges; if then light blows be given to the wall by the right index, the undulatory movement will be perceived by the left. Valuable information is gained by observing the variation of this sign as to position and clearness, with alterations in the posture of the patient. For the most part it results from the presence of fluid beneath the abdominal walls, but not constantly. Gelatinous matter, either free within the cavity of the abdomen, or encysted, imparts sensation not distinguishable from fine fluctuation, and a similar sensation has been more than once imparted to the hand by an enlarged spleen. A little care, however, readily distinguishes this last phenomenon from the fluctuation arising from the presence of liquid. When collections of matter occur within the abdomen, and point like an ordinary abscess at the surface, fluctuation is to be detected by the alternate movement of the fingers adopted by the Surgeon when he suspects its existence in other of the soft parts of the body.

14. *Pulsation.*—The pulsatory movement of the large vessels of the abdomen is mostly lost to the touch, as well as to the eye, before reaching the surface. The pulsation of the aorta, however, may be felt on deep pressure over its course, especially in persons of spare conformation or emaciated by disease. In some cases of disease it is very manifest, extending sometimes even to the femoral arteries, which then beat with increased force. Its seat, extent, direction, whether merely elevating the hand, or presenting lateral expansion also, its connection with felt tumour, and its degree of permanence, are all to be observed in any endeavour to

estimate its cause and semeiological value. A pulsatory sensation at the angle of the epigastrium often occurs in connection with thoracic or cardiac disease.

15. *Thrill* mostly arises in connection with the vascular system; it may then be observed as an accompaniment of felt pulsation, or independently of it. It may be intermittent, corresponding then with the arterial pulse, or continuous. It is not a necessary indication of disease in the vessels; nor, where this exists, is it a measure of its amount, since a moderate degree of pressure will elicit it in a patient with healthy arteries whose blood is poor (*spanœmia*); and this same condition of the circulating fluid will exaggerate its intensity when it arises in connection with disease of the vessels. A thrill may arise, however, independently either of a morbid state of the blood or vessels as shown by Dr. Swett from friction of the heart upon a tuberculated liver.

16. *Altered palpable signs having reference to the organs of the chest.*—Two of these are of especial value. 1. *An altered seat of impulse of the apex of the heart* to a level considerably higher and more to the left than natural. This arises from the displacement of the organ by some of those diseases of the abdomen which elevate the left arch of the diaphragm by the pressure which they exercise upon it from below. 2. *A diminution of the tactile vocal vibration*, which, in certain diseases which compress the thoracic viscera, is not observed to extend as low as is customary in health.

The signs of pregnancy afforded by palpation will be most conveniently described under that subject.

It has been remarked that certain organs which in advanced disease exhibit signs which are ascertainable by physical examination of the abdomen, occupy in health a position in the pelvis which prevents their being explored through the soft parieties of the belly. The alteration of their position which renders this sort of examination practicable has the further effect of removing those diseases which occasion it from the category of pelvic into that of abdominal maladies,—so far, at least, as to render them capable of confusion with those affections which arise as morbid states of truly abdominal organs; it consequently becomes sometimes necessary in their diagnosis to make use of palpation through the lower aperture of the pelvis, by the introduction of the fingers into the canals of the rectum and vagina. It will therefore be necessary to make a few brief observations on these modes of examination.

Examination by the Vagina.—For most purposes the best position for the patient is supine, the physician standing on the right side for the faci-

lity of using his right hand in the examination. The index finger is mostly sufficient, but sometimes both that and the middle finger are requisite: they should be well greased, and slowly and carefully introduced. The fingers being introduced, the elbow should be depressed, so as to allow of their being carried in the direction of the axis of the pelvis. Another mode of insuring the correct direction is to introduce them by passing the hand just beneath the raised right thigh of the patient. The obstetric position upon the left side, adopted by some practitioners from motives of delicacy, is open to many practical objections, the most serious of which is that the back of the finger comes in contact with the anterior part of the vaginal wall, and there is so much difficulty in turning it, that signs of disease on that side may easily escape detection. It is often desirable, however, to make the examination of the patient while standing, as for the detection of ballotment, in pregnancy, or where the weight of felt parts or organs has to be estimated. Pressure with the unoccupied hand may be advantageously employed sometimes above the pubes, either to bring the parts more readily under examination by depressing them in the pelvis, or to estimate their size connections, &c., by grasping them between the two hands, the one below and the other above. This often requires, however, the depression of the hand far down behind the pubes, which, although readily effected after labour, or in females with lax abdominal walls, requires in many that the shoulders should be raised considerably, and the thighs well flexed upon the trunk. The rectum and bladder should be evacuated prior to the examination, so as to avoid the fallacies which might arise from their distension, and to admit the more ready employment of pressure in various desired directions. *In the normal state* the attachment of the vagina into the neck of the uterus is readily reached. The cervix uteri is perceived as a somewhat conical projection beyond the line of attachment, of about ¼ to ½ an inch in length, firm, and presenting at its apex a transverse depression bounded by a firm lip anteriorly and posteriorly. The vaginal wall allows of pressure being exerted in all directions without resistance by the finger within it, whether latterly by the sides of the uterus, or upwards from the cul-de-sac in front or behind its attachment to the cervix. The cervix is capable of being moved, and with it the entire womb, by the pressure of the fingers.

In the performance of *vaginal examination in disease* the same objects should be had in view as in palpation of the exterior of the abdomen,—viz., to ascertain the position, extent, form, weight, consistence, and mobility of all organs and morbid structures which the finger is capable of reaching, as well as alterations in the direction and dimensions of the vagina itself, and the existence of projections or bulging into its canal,

Once the finger is in the vagina, the examination should be proceeded with leasurely, so that no imperfection in it shall render necessary its repetition on a future day; a hurried exploration is rarely productive of any useful result.

Examination by the rectum may be made in the same manner as that by the vagina, or the patient may be placed upon the side. The finger should be well lubricated, and slowly introduced through the sphincter. This may be relaxed by requesting the patient to bear down, and the tip of the finger being then applied to the anus it can readily be made to slip up during the subsequent contraction. By this mode of exploration the organs and growths at the posterior side of the pelvis can be felt, and in some subjects the ovaries; this, however, is rather the exception than the rule when the latter organs are in their normal position and of their normal bulk. The finger can, of course, feel any resistance within its reach, arising from constriction of the canal of the rectum. In some cases, useful information is gained by the simultaneous use of the finger and thumb, the former in the rectum and the latter in the vagina; intervening structures may thus be grasped between them, and their character and nature more fully ascertained.

Much as it has been abused, too, there are cases in which the employment of Simpson's *Uterine sound* is indispensable for arriving at a correct diagnosis when necessary, it should not be paraded, as the introduction of an instrument of any kind into the vagina is especially repugnant to the feelings of the patient. Being warmed by placing it up in the sleeve, or by moderate friction with the hand, the opportunity of the fingers being in the vagina should be taken for its use, if it should, after other examination has been made, appear desirable. The point of the instrument must be guided by the examining finger to the os uteri, when gentle pressure will enable it to enter the cavity of the cervix. The points which are to be ascertained by it are, the length of the cavity and its direction, the mobility of the womb, and thus its attachment to other structures or organs within the simultaneous reach of the examining finger, or of the finger placed in the rectum. The thickness of the wall of the uterus may often thus be estimated at the spot which corresponds to the extremity of the sound. Accidents have arisen in connection with its employment, and even metritis is said to have been occasioned by it. I have met with none of these, however, in my own practice. It need scarcely be said that the suspicion even of pregnancy must decidedly negative employment, and that when used all roughness of manipulation must carefully be avoided, —*Medical Gazette, Aug.* 1*st*, 1851, *p.* 194.

(*To be continued.*)

KING'S COLLEGE HOSPITAL.

Epileptic Mania.

(Under the care of Dr. TODD.)

A PATIENT affected with epileptic mania was lately admitted into this hospital, whose violence reminded us very strongly of the following passage in Esquirol's excellent work, "Des Maladies Mentales."—"The fury of epileptic patients breaks out after the fit, rarely before; it is of a very dangerous kind, blind, and in some degree automatic. Nothing can tame it; neither the sight of powerful instruments of restraint, nor moral influence, which means generally succeed with ordinary maniacs. Their violence is so terrific, and so much dreaded, that I saw, in an asylum of the South of France, all the epileptic patients tied down to their bed every evening, so great was the apprehension they created."

It is unfortunately but too well ascertained that epilepsy, by the violent shocks which its attacks convey to the brain, is very frequently followed by a derangement of the intellectual faculties. Aretæus has mentioned the fact, and Van Swieten says, in his commentaries on Boerhave, that he had seen many patients who had been deranged from their childhood, after frequent epileptic fits. But there is a variety, to which Dr. Todd's patient belongs, marked by no aberration of mind, and which is distinguished by an attack of furious madness after each fit; the peculiarities of this variety being regularly transmitted from sire to offspring.

Facts pointing to hereditary transmission are not wanting; we see them in various kinds of diseases and peculiarities, and especially in the different abnormal states to which the nervous system is liable; and yet we find that so observant a man as Tissot disbelieved hereditary influence; this doubt was also raised by Dousson, Dubreuil, &c., whereas Saillant, Maisonneuve, Hoffmann, and Esquirol, fully believe in the transmission here spoken of. The example we have this day to adduce, as seen at King's College Hospital, will illustrate in a very positive and sad manner how plainly and distinctly the fearful disease and its peculiarities pass from parent to child. The case offers, however, an exception to a rule observed by Esquirol—viz., that epilepsy is more frequently transmitted *by the father* than by the mother, the reverse generally happening with ordinary alienation of mind. The following details are derived from the notes of the clinical clerk, Mr. Maurice Davis:—

Samuel D——, aged twenty-nine years, a contractor, married, and without family, was admitted under the care of Dr. Todd, Sept. 30, 1851. From his birth to his twenty-first year he was subject to an eruption on the crown of the head, which discharged copiously, and which sometimes

formed a thick yellow crust (porrigo ?) This affection defied all therapeutical means for a number of years, but when the patient had reached the age of twenty-one, it healed spontaneously. Soon afterwards he began to suffer from severe headache, both in the temples and vertex, the latter locality having been the seat of the eruption. The pain made him giddy, and reel as if intoxicated; the paroxysms lasted about half an hour, and returned at the changes of the moon. As the patient grew older the attacks became more severe and more frequent.

The first time one of these severe attacks occurred, he was in a cart, turned giddy, fell, and carried with him several pieces of timber. Some of his ribs were broken, and the patient was taken in a state of unconsciousness to the Westminster Hospital. Another time he fell down among some horses he was feeding, and received from one of them a kick in the abdomen, which injury causes, even now, pain in the part. He had several fits afterwards, from which he suffered more or less injury to bones, &c. The attacks did not recur for a whole year, but with the last fit he, for the first time, exhibited violence, and this took place five years before the present inquiry.

The patient now married, and soon afterwards had a fit, after which he was so violent that six policemen could hardly hold him. An attack subsequently occurred whilst the patient was in bed, and in this circumstance, as had been the case in several others, the violence abated when his head was tightly bandaged, and vinegar applied to the temples. The paroxysms, always accompanied with much violence, followed each other at about three month's interval; and they were now marked with extreme pain in the head, both in the temples and vertex. During the fits he is unconscious, raves, and makes repeated attempts to bite and otherwise injure those around him.

The patient's mother was affected with the same kind of fits from her birth, and they increased in severity as she grew older. She was quite as violent as himself, and in one of these fits, which confined her to her room for six weeks in a state of incessant and violent mania, she died at the age of thirty-five, eleven years ago. She was the eldest of her family; her mother and two of her sisters had died of the *same kind of fits*. One of her aunts was living a year ago in Bethlehem Hospital, affected in an analogous manner. The uncles and aunts are quite well.

The patient is the eldest son, and has two sisters who are both in perfect health. The brain of the mother was examined by Dr. Hastings, who reports it to have been (the patient states) full of corruption.*

* Morgagni examined the brain of a woman who had had epileptic fits for two years. The anterior third of the left hemisphere was considerably sunk and extremely soft.

When the patient whose case we are relating felt any premonitory symptoms, he did not retire to rest with his wife, for fear of doing her harm; and he has of late, when thus left by himself at night, gone out, and wandered about in an unconscious state, until he found himself in some strange place, recovering from a fit. On the 30th of August, the day of his admission into this hospital, he went out, for the purpose of conveying implements into the city; but after reaching Whitehall, he was probably seized with a fit, for he has no recollection of what passed afterwards, until he found himself bound to his bed on the morning of the 31st. The patient had been brought on a litter, by two policemen, in a most violent state, raving and struggling to free himself, crying with pain, and begging the by-standers not to knock his head, within which he seemed to be suffering excruciating agony. When the paroxysm somewhat subsided, he endeavoured to bite anything in his way—his garments, or even his own hands—his eyes being bloodshot, and pupils dilated.

Chloroform was offered him for inhalation; he took it very readily, and was soon under its influence; and while in this state the pupils became more freely dilated. He remained quiet, and appeared to sleep comfortably for about twenty minutes. After this time he recovered his consciousness, and answered questions rationally. He would now and then, however, have fits of violence, and since he, by experience, felt their approach, he would warn the by-standers of their recurrence.

As he could not answer for his own rational behaviour, he was pinioned to the bed whilst the pain and fits alternated. The nature of the fit which occurred before his admission could not be well ascertained. Whilst being carried on the litter, the violent pain was suddenly arrested by accidental pressure being applied to the patient's temples; when this was discovered, a bandage was tightly placed round the head, and pads on the temples, with very good results. The patient states that by these means he could always stop or alleviate the paroxysms in his mother, when the latter was seized in his presence.

On the next day, he had a sensation of weight at the temples, but experienced relief from the ice which had been placed on his head. On the third day he was walking about in the ward, and slept well until three o'clock next morning, when his head began to ache severely, and he started up, but could not release himself. The pain in the head continued for the two following days, but was greatly relieved by the tight bandage around his temples; he was in the meanwhile taking quinine. On the seventh day he had a very good night, but when he first awoke, he could scarcely see for a few minutes, and said that he felt as if he had had a skin before his eyes, especially the left. The patient has had an attack of gonorrhœa, for

which lotio-plumbi injection was used; he had here and there fits of headache, but no actual epileptic seizure, and was discharged on the 10th of September, 1851, eleven days after admission.

Such cases as the above are of rare occurrence, and the circumstance is so much the more fortunate, as the disease especially when caused by heredity, is acknowledged as incurable. In fact, Esquirol says, "When epilepsy has been transmitted by heredity there is no cure for it." The development of the disease, occurring upon the cure of scald-head, is worthy of notice, though such coincidences have frequently been noticed. It has been observed that the metastasis of a cutaneous eruption, the healing of an ulcer, or the cessation of an habitual evacuation, has given rise to epilepsy. Dr. Maisonneuve, (1803,) mentions a boy of nineteen, who cured himself of porrigo on the head with cold water, and became epileptic a few days afterwards; and Cartheuser noticed, that in Sweden epilepsy often was the consequence of the removal of tinea capitis with cold water, a remedy frequently used for such cases in that country. Would, with Dr. Todd's patient, the hereditary influence been kept at bay if the scald-head had been allowed to continue?

The advantages of pressure around the cranium, which were manifested in this case, deserve a moment's attention: that it invariably diminished the intensity of the fit is quite clear, but how did the pressure act? Was it by counteracting the probably soft state of the encephalon, or by preventing the two rapid influx of blood upon the brain? Whatever may be the *modus operandi*, the fact is worth noting; and as vinegar and ice also alleviated the pain and diminished the violence, one is tempted to inquire what effect complete congelation, according to Dr. James Arnott's plan would have had; the more so as this freezing method has been known to be very efficient in headache.

We would, finally, draw attention to certain statistics which show what proportion of epileptic patients suffer in their intellectual faculties, and to which varieties of alienation they are liable. The numbers were collected by Esquirol, and they refer to women, who, according to this author, are more numerous than men in epileptic wards by one-third. He considers that this larger number of women (and children) is due to the greater delicacy of their nervous system. Out of 325 females suffering from epilepsy at the Salpetriere, at the time of M. Calmeil's superintendence, 46 were hysterical, 12 were attacked by monomania, 30 were maniacs with a propensity to suicide, 34 had fits of maniacal fury, (with 3 the violence only broke out after the fit;) 145 were in a state of dementia; of these there were 16 who had no lucid moments at all, whilst the rest fell into dementia only after the fit, and 2 had then paroxysms of great violence; 20 had weak

memory and a tendency to dementia; and 60 enjoyed the full use of their intellect, but were peevish, given to fits of anger, &c. Thus it will be seen that four-fifths of all the above-mentioned prtients were more or less deranged.

We took, a little time ago, a lively interest in a case of dementia connected with epilepsy, under the care of Dr. Babington, of Guy's Hospital. The patient was a very good-looking little boy, whose history we would fain subjoin, but we are obliged, in order not to outgrow our limits, to postpone it to another "Mirror."—*Lancet, October* 18, 1852.

TREATMENT OF DIARRHŒA BY SULPHURIC ACID.

To the Editor of THE LANCET.

IN complaints so prevalent, so fatal in their consequences, and so open to diversity of opinion as to their pathology, as cholera and diarrhoea, observations on the beneficial effects of any given remedy are worth all the hypotheses in the world; and by the man engaged in actual practice, dissatisfied as he is but too frequently with the treatment of these affections deduced from theory, will be hailed with the greatest satisfaction. It is, however, only after repeated successes that the greater part of the profession can be induced to place confidence in, or give trial to, a new remedy. Hence the necessity of recording in a public journal the experience of those more bold, who have been first to test the value of an original proposition. On this account, I am induced to add my mite of attestation to the efficacy of dilute sulphuric acid in passive diarrhoea.

During the present season some hundreds of cases have fallen under my care, the majority of which have readily yielded to the usual treatment—chalk, kino, tincture of opium, &c. Still, from time to time, more obstinate cases presented themselves, in which these things seemed altogether useless. A few weeks ago, when the first notice of the sulphuric acid plan was inserted in THE LANCET, I chanced to be tormented with a very obstinate case, of three weeks' standing. The subject, a child of five years, was in the last stage of prostration, from the constant drain on the system: every means prescribed had failed to afford anything more than temporary relief. I gave the sulphuric acid, diluted, in fifteen-drop doses, every hour, and was no less gratified than surprised to find, the next day, very considerable improvement, the purging reduced in frequency to three hours or longer intervals. In short, by continuing the treatment another day, this apparently moribund child was restored to life, and ultimately to

health. Encouraged by this success, I have since that time given the acid freely, (occasionally combined with tincture of opium,) and have been equally satisfied with the result. In cases, however, in which we have much straining and pain, and other dysenteric symptoms, I have found the acid comparatively valueless. In conclusion, I would observe, that another advantage, of no little importance in the treatment of children, attends the use of this remedy,—i. e., it can be made grateful and pleasant to the palate with a little syrup.

Tachbrook-street, Belgrave-road, G. B. Payne, M. D.
Oct. 11, 1851.—*Lancet, Oct.* 18, 1851.

SURGERY.

REPORTS OF

CASES OF HYDROCELE, WITH RUPTURE OF THE TUNICA VAGINALIS.

By George Yeoman Heath, Esq., Surgeon, Newcastle-on-Tyne.

Case 1.—Guy W——, aged thirty-five, a lead miner, came to me on May 26, 1850, by desire of my friend, Mr. Featherstonhaugh. On the left side of the scrotum was a moderately tense swelling, as large as the fist, tender when handled, and obscurely fluctuating. It occupied the usual position of a hydrocele, and, taken by itself, it had the ordinary form of one point. But in front of this was a second swelling, about the size of a pigeon's egg, and of similar shape, the large end towards the larger tumour, the apex projecting forwards; it was softer than the larger swelling, and distinctly fluctuating. Both swellings were transparent, the anterior smaller one particularly so, and its coverings appeared much thinner than those of the posterior. By careful examination fluctuation was found to pass from one swelling to the other. The cord and the inguinal apertures were healthy.

The patient gave the following history: He first observed an enlargement in his scrotum three months previously; it was then very small, and more painful when handled than at present. He did not remember to have received any injury to the part, but believed it might have been hurt by the low wooden stool on which he sits whilst at work. The enlargement gradually increased, until a month previously, when it had acquired the size of the posterior swelling at present. At that time he met with a fall, and on examining the part subsequently, the enlargement was found much increased, but softer and discoloured. The discoloration and soft swelling

gradually disappeared, leaving behind a tense swelling, not bigger than a hen's egg, and of uniform shape. This increased in size pretty rapidly, and began shortly to assume the form it bore when he came to me.

Notwithstanding the peculiar form of this enlargement, its transparency and fluctuation, together with the history of its origin, left no doubt as to its nature; it was evidently a collection of fluid, contained in part at least within the tunica vaginalis.

On the 29th Mr. Featherstonhaugh introduced a trocar, and drew off about six ounces of clear, straw-coloured liquid, both swellings being emptied by the same opening. No injection was used at this time, the man not wishing to loose his work by being laid up.

On the 4th of July this patient was admitted into the infirmary of this town under my brother. The sacs had refilled, and the enlargement presented the same appearance as above described.

On July 9th it was tapped, and equal parts of tincture of iodine and water were injected. Considerably inflammation ensued, accompanied by an effusion of lymph of some solidity.

After a few days, however, the hardness disappeared, and the part was left in much the same condition as at first, but the swelling was less tense. From this flaccidity of the enlargement the relation of its two parts was more easily examined. The covering of the anterior prominent portion was evidently much thinner than that of the posterior swelling. They communicated by an irregularly circular opening, into which the point of the fore-finger could be pushed. On examination with a lamp the whole was seen to be transparent, and at the point of connextion of the two sacs, a darkish ring could be made out, behind which the transparency of the posterior sac was less distinct.

On the 30th the hydrocele was again tapped, and equal parts of port wine and water were injected.

On the 31st, there was much swelling and inflammation, and some constitutional disturbance.

On the 6th of August, the anterior swelling being still distinctly fluctuating, and the skin covering it red, it was punctured, and a tablespoonful of pus evacuated. The posterior swelling was solid and consistent; and by pressure on it no pus could be made to flow from the opening.

On the 8th, a slough presented at the puncture which had been made on the 6th. The opening was enlarged, and a whitish slough, apparently the remains of a small sac, removed. The posterior swelling, diminished in size, continued firm and consistent.

By the 15th, there was no appearance of any anterior swelling, and the

opening made was healed up. Some hardness remained in the site of the posterior swelling.

On the 21st, the patient left the infirmary: there was still some thickening about the posterior sac, but no appearance of any re-accumulation of fluid.

Remarks.—From the history of the case, and from the physical signs presented by the part at different periods, it seems most probable that the course of the complaint and the nature of the anterior swelling were as follows: In the beginning there would seem to have been an ordinary hydrocele; by the fall which happened when this reached some size, the tunica vaginalis was lacerated, its contents being effused into the cellular tissue of the scrotum beneath the dartes; by degrees the effused liquid and extravasated blood were absorbed, but the hydrocele was not removed, nor the laceration in the tunica vaginalis healed. As the tunica vaginalis became again distended by the re-accumulation of the fluid, this would at last reach the laceration in the upper and anterior part of the sac, pass through gradually, and in small quantities at a time, and thus, by its irritation, give rise to the formation of a cyst in the cellular tissue communicating with the tunica vaginalis. The thickness of the covering over the anterior swelling its softness and extreme transparency, and the distinct ring-like communication between the two sacs, all seem to point to this explanation of the appearances, whilst there is sufficient evidence of the rupture of the tunica vaginalis in the history of the case.

If anything were wanting to confirm this view, it would be found in the very striking circumstance of a different action being simultaneously excited in the two sacs, by the inflammation consequent upon the port-wine injection; an effusion of lymph taking place from the serous tunica vaginalis, and pus being formed in the sac derived from the cellular tissue; each part behaving according to its peculiar nature, although forming part of what, before the injection, might be considered a single cavity.

After the effusion of lymph into the tunica vaginalis, the communication between the two sacs would be blocked up, and the inflammation in each membrane left to pursue its natural course. The ultimate death of the cyst and separation in the form of slough, illustrates the inferior vitality of these supplementary structures as they may be termed.

The absence of suppuration after the injection by iodine may be accounted for by the fact, that the quantity of fluid used was insufficient to distend the tunica vaginalis, and to reach the opening into the cyst.

From what I have noticed in consulting various surgical works upon this subject, it would seem that rupture of the tunica vaginalis, in cases of

hydrocele, has not attracted much notice. That such an event may happen is for the most part recognised, but very cursorily or indirectly, and sometimes not at all. I have not met with any detailed account of the symptoms to be expected upon such an accident, and as its sudden occurrence would certainly be a source of alarm to a patient, and might be a cause of perplexity to a surgeon, the subjoined case may not be uninteresting; it illustrates also the case already related.

Case 2.—Whilst resident, some time ago, as house-surgeon in University College Hospital, I was sent for suddenly to see a relative, living a little distance out of London, supposed to be suffering from rupture. On arriving at the gentleman's house, I found him in bed, and in some alarm at the state of the scrotum, which was much enlarged and slightly discoloured. The swelling was distinctly fluctuating, loose, and flabby; the scrotum, indeed, except in colour, resembled nothing so much as a bladder partially filled with water; there was very little œdema, such as is seen in dropsy. The skin was discoloured in points here and there from extravasation of blood. There was little or no pain, and the part could be handled freely. The testicles on both sides could be distinctly felt; the cord on each side was free. The fluid was chiefly on the left side, but was not confined to it. The account given me by the patient was to this effect:—

For some months the testicle on the left side had been, as he supposed, enlarged; but as no particular inconvenience was experienced, he had not thought it necessary to take any steps with regard to it. On the evening previous to my being sent for, on taking his seat in a carriage, he crossed one leg over the other, and as he did so, became at the same time aware that the enlarged part was caught between the thighs, and left a sharp pain. On reaching home, it was found that an alteration had taken place in the size and appearance of the pre-existing tumour. In the morning, the change in the tumour being more completely ascertained, and some discoloration of the skin having also then appeared, he felt alarmed, and sent for me.

There was little difficulty here in coming to a conclusion as to what had happened; the history of the case, the existence during some months of a firm swelling devoid of pain, the sudden change in the form and consistence of this tumour following the application of violence, and lastly, the appearances exhibited when I saw the part, all tended to show that there had been a hydrocele of the tunica vaginalis, which had been ruptured. The only diseases which these signs might possibly have been supposed to denote, were rupture, anasarca of the scrotum, and extravasation of urine. A slight examination sufficed to show the absence of any her-

nia ; the history of the case, and the absence of dropsy in other parts of the body, negatived the idea of anasarca ; the fluid, too, did not appear to be in the cells of the cellular tissue, producing considerable œdema as in anasarca, but rather to move freely as in a bag formed by the dartos. There had been no impediment to the passage of the urine which could have led to its extravasation.

The treatment pursued consisted in raising the part upon a little chaff pillow covered with oil-silk, in the application of an evaporating lotion containing carbonate of ammonia, and in the administration of a gentle aperient. The fluid was rapidly absorbed, but the hydrocele was not cured ; the rent in the tunica vaginalis healed, but the sac refilled, and was at a subsequent period tapped and injected with a solution of sulphate of zinc, by which a permanent cure was effected. Oddly enough, on the absorption of the effused fluid, another hydrocele became manifest in the tunica vaginalis of the right side, where, as far as my patient had observed, there had been no previous enlargement. This second hydrocele was not cured by injection of a solution of sulphate of zinc of the same strength as that used on the left side. Port wine, afterwards used, also failed. But the collection of fluid formed subsequently to this second injection was very small. It was not interfered with again, and now after the lapse of five years, it remains in much the same state.

Rupture of Tunica Vaginalis, and change in the contained fluid.

Case 3.—A few weeks ago I had an opportunity of tapping a hydrocele of the tunica vaginalis, in which a change had taken place in the contained fluid, apparently in consequence of repeated rupture of the tunica vaginalis. The man who was the subject of this hydrocele has been in the habit of coming to me every year, for the last three years, to have his hydrocele tapped. When he presented himself this time, a few weeks ago I noticed that the swelling was much larger than on any previous occasion ; he said also that he had suffered more pain in it. The fluid withdrawn was of a dark-brown colour, without any smell, and not unlike what I have seen taken from the antrum. It putrified rapidly, and before there was any opportunity of examining it microscopically. The patient told me that the swelling had burst three times ; and on questioning him, I found he meant that it had burst internally; no discharge of fluid had taken place externally. It should be observed that this man breeds and kills pigs, and that from examining the testicle in these animals, he was quite aware of the seat of the complaint in himself; and it was his idea that the bag of the testicle, as he called it, had burst. It seems probable that this rupture of the tunica vaginalis was connected with the change in the nature of the

contained fluid. Possibly it might have been found, under the microscope, to contain blood-globules.—*Lancet, October* 18, 1851.

MIDWIFERY.

DR. ARNETH'S CLINICAL MIDWIFERY.

During the sixty-seven years of its existence, (1784—1849,) there have been delivered within the walls of the Vienna Lying-in-Hospital, 204,243 women; 7878 mothers, and 11,092 children (of 189,185 born alive), dying within the same period. The establishment is divided into a *paying* and a *gratuitous* section. Into the former, for very moderate payment, women of all ranks are admitted, every provision being made for the secrecy of such admission, and even if they desire it, for the concealment of their persons during their residence. Ladies, even of high rank, avail themselves of so convenient a retirement. Into the gratuitous section, admission is made temptingly easy. Any woman who declares herself pregnant with an illegitimate child, is admitted as a matter of course, a considerable time prior to labour; and if she chooses, she is, after its conclusion, transported with her child to the Foundling department, or she may leave her child there without charge. If, however, she is a married woman, some little difficulty is made as to her admission, until she has procured the necessary certificates of extreme poverty. So popular is this portion of the establishment, that of 7772 women delivered in 1849, 7394 resorted to it. In this the woman may, if she choose, also conceal her name and residence. With such an institution as this, it is not surprising to find Knolz reporting from official sources, that in 1843 for 9140 legitimate births, there were 8427 illegitimate, and that almost a third of the entire number of the births occurred within the walls of the hospital. We think all must agree with Mr. Wilde,* in regarding this ready reception and comfortable maintenance of unmarried women, as possessing a very demoralising tendency. The only compensation that we are aware of, is the smaller number of infanticides which obtains in Vienna, as compared with most cities; and this by some may be deemed sufficient. We think otherwise. A large proportion of illegitimate births indicates the prevalence of a state of society that is fertile in the generation of many crimes, much more beyond legislative interference than is

* Literary, Scientific, and Medical Institutions of Austria. 1834.

infanticide; and the frequent severance of a tie so instinctive and so forcible as that of maternal love, which the existence of a large population of foundlings implies, is accompanied by the deterioration of other virtues and qualities, whose integrity can alone secure a sound frame-work of society. Moreover, the consignment of large numbers of young infants to Foundling Hospitals, is owing to the enormous mortality of such establishments, but infanticide in another form. We have frequently heard it stated as an anomaly, that London, amidst its numberless charities, should possess no receptacle for the admission of unmarried women in this their bitter hour of trial; but we feel convinced that, taking an enlarged view of the subject, the introduction of this class of establishments is not desirable. Every woman, married or unmarried, and unprovided with means, has a legal claim upon the parish in which she resides.

In return for the advantages they receive, the women admitted into the gratuitous division are rendered serviceable for the instruction of pupils: two Clinics being thus formed,—the list for the instruction of medical students under Professor Klein, and the second, for the instruction of midwives under Professor Bartsch. To the latter Dr. Arneth was attached in the capacity of Assistant for the space of three years. From the period of the establishment of the second Clinic in 1833 to 1849, 39,141 women were delivered of 39,572 children. Of the mothers, one in 24¾ died. For every 95 female births, there were 100 male ones. The child was born dead or still-born, once in every 25 births, (1 in 24 males, 1 in 26 females,) 1 in 25 of the children born living died within the first nine days, (1 in 21 males, 1 in 29 females.) The number of children's deaths was, however, greater than this actually; as, when they were deprived of their mother's breast, from any cause, they were at once removed to the Foundling department, beyond the sphere of the author's observation. A twin birth occurred in every 87, and a triplet in every 13,040. This department was under Dr. Arneth's practical management, from October 1847 to October 1849, during which time 269 midwives are educated and 6527 women delivered. Besides this, anything remarkable occurring in the other departments during this period, as well as during another year that he continued at the institution, came under his cognizance; so that, although the period was short, he was made acquainted with all the interesting facts of more than 14,000 cases. His statistical statement, however, only embraces the 6527 labours which occured during his two years of office in the second Clinic.

Of the 6608 children, 6363 were born with the *occiput* forwards, *i. e.* 96 per cent., a proportion almost exactly corresponding to that stated by

other observers, as Boivin (95), Lachapelle (93), Collins, Hardy and M'Chintock, (96).

Among the 6608 births, 40 cases of face-presentation occurred (1 in 165). Of the males, 22 were born living (4 dying within nine days), and 3 dead. Of the females, 13 were born living (3 dying soon after birth), and 2 dead. All these deliveries took place without any artificial aid. This presentation was met with by Boer once in 116, by Clarke in private practice once in 545, by Collins once in 504, by M'Clintock and Hardy once in 478, by Boivin once in 277, by Lachapelle once in 216, by Oldham once in 220, by Busch once in 112, and by Hoffman at Wurzburg once in 132. The lesser proportion met with at Dublin arises from the vertex-presentation with the face to the pubes not being considered as a face-presentation, as it seems to have been by some of the other observers. Adding together the entire number of cases occurring in Dr. Arneth's practice and in the practices of the various authors he quotes, we find that in 144,694 births, there were 732 face-presentations, *i. e.*, about 1 in 197½.

Breech presentations.—Among Dr. Arneth's 6608 cases, there occurred 113 breech presentations (1 in 58), in 34 of which there were twins, and in 28 premature births; so that there were only 55 single births of full-timed children, or 1 in 120. Of the 113 children, 44 males were born living (7 dying during the first few days after birth) and 9 dead; and 50 females born living (11 dying within nine days) and 10 dead, *i. e.*, 19 children being born dead, or near 1 for every 5 born living. Boer met with 1 breech-presentation in 54 births, Collins 1 in 52, M'Clintock and Hardy 1 in 50, Simpson 1 in 53, Lachapelle 1 in 44½, and Boivin 1 in 55. Taking the entire number of figures furnished by the author, we find that of 159,593 births, 3000 were breech-presentations, *i. e.*, 1 in 53.

Feet-Presentations.—The number of these in the 6608 births amounted to 59, *i. e.*, 1 in 112, of which, however, 17 were premature and 16 twin-births, giving but 29 single full-timed children, *i. e.*, 1 in 227. Of the 59 children, 29 males were born living (6 dying within nine days), 9 dead, and 19 females living (of whom 4 died) to 2 dead—giving $5\frac{4}{11}$ children born living for 1 born dead. Boer found 1 footling in 119 births, Klein 1 in 193, Bartsch 1 in 152, Collins 1 in 90, M'Clintock and Hardy 1 in 109, Oldham 1 in 194, Lachapelle 1 in 66 from 1803—11, and 1 in 71 from 1812—20, and Boivin 1 in 82. A sum total of 168,596 births furnished 1623 foot-presentations, or 1 in 104.

Cross-presentations.—In the 6608 births, turning, on account of cross-presentation, was required 32 times, *i. e.*, 1 in 206½. The proportion of such presentations met with by Klein was 1 in 266, by Bartsch 1 in 147, by Clarke 1 in 347, by Collins I in 416, by M'Clintock and Hardy 1 in 257, by Lachapelle 1 in 230 for 1803—11, 1 in 188 for 1812—20, and by Boivin 1 in 256. In 214,592 births there were 964 cross-presentations, *i. e*, 1 in 222 ; these numbers, including 48,557 births reported by Ramsbotham, furnishing 1 cross-birth in 326.

Turning.—Besides turning in 32 cases on account of cross-presentations, this operation had to be resorted to 6 times for placenta prævia, twice for descent of both arms with the head, three times on account of narrow pelvis, and once for descent of a foot with the head—in all 44 cases, or 1 in 150 births. Of these 44 children, 14 were born dead, 6 died within nine days, and 24 were alive and well at the end of that period. Of 43 mothers, three died.

Forceps Operations.—In the 6608 births, the forceps were resorted to 45 times, or once in 146 births. Boivin employed them once in 214, Lachapelle during 1803—11, once in 168, and during 1812—20, once in 288. Collins employed the forceps and lever (which last M. Arneth makes no mention of employing) once in 574 cases, and M'Clintock and Hardy resorted to the forceps once in 279, and to the lever once in 378 births,—viz., to either forceps or lever in 42 out of 6702 births, or once in 159½. Boer used the forceps once in 251 births, Klein once in 48, Bartsch once in 72. The two latter practitioners are the directors of the Vienna Lying-in establishments : and it will be observed, that Dr. Arneth's own forceps operations are proportionally far less than theirs, viz., 1 in 146. Adding together the cases recorded by all the above-named observers, we find, that in 168,179 births, the forceps were employed 1289 times, or once in 130 births.

In 28 of the author's 45 cases, the forceps were applied simply for deficient pains, in 5 for the same cause united with slight pelvic narrowness, 3 times for moderately contracted pelvis, 5 times for eclampsia, once for eclampsia and hæmorrhage, once for a prolapse of the funis and hand, once for the prolapse of the arm with the head, and once for the delivery of the head in a breech presentation. Of the children, 31 were born living (7 dying within a few days), and 14 dead.

Perforation.—In the 6608 births, Dr. Arneth had to resort to perforation but 4 times for very narrow pelvis, *i. e.*, once in 1652, two of the wo-

men dying. Boivin perforated once in 1282, Lachapelle (1803—11) once in 1118, and (1812—20) once in 1853, Collins once in 139 (once in 210 for tedious labour), M'Clintock, and Hardy once in 106 (once in 129 for tedious labour), Boer once in 587, Klein once in 668, Bartsch once in 1475. The total numbers give for 168,179 births, 336 perforations, or one in 500 births. Of these, the Paris female practitioners have reported 68,412 with 42 perforations (1 in 1628), the practitioners of the Vienna Hospital 76,411 with 111 perforations (1 in 688), and the Dublin practitioners 23,356 with 183 perforations (1 in 127½). Dr. Arneth advocates the preferability of perforation to the *Cæsarean section* far more strongly than is customary with continental practitioners; and he informs us that for the 193,271 births that have occurred at the Vienna Hospital (1789—1849), the section has been only resorted to five times, and always with a fatal result.

Summary of Operations.—M. Arneth furnishes us with tabular views of the operative procedures of the different practitioners above referred to, which are far too long for reproduction here. We think, however, it will prove of interest to our readers, if we prepare from them a synoptical view of the comparative frequency with which these different operations are resorted to, and which we have already stated in detail. Mesdames Boivin and Lachapelle in this represent the Paris practice; Boer, Klein, Bartsch, an Arneth, that of the Vienna Hospital: and Collins, M'Clintock, and Hardy, that of the Dublin Hospital—the cases in which the lever was employed by these last being here included under the head of "Forceps Operations." We regret that we cannot present also a comparative view of the mortality of the mothers and children; but an account of this is only given in some of the tables, and is consequently useless for purposes of comparison:

	Paris.	Vienna.	Dublin.
Total Births..	..68,412	76,411	23,356
Total Operations	875 (1 in 78)	1526 (1 in 50)	321 (1 in 72½)
Turning.....	547 (1 in 125)	451 (1 in 169½)	70 (1 in 333)
Forceps.....	266 (1 in 257)	955 (1 in 80)	68 (1 in 343½)
Perforations....	42 (1 in 1628)	111 (1 in 688)	183 (1 in 127½)

Prolapsus of the Funis.—This accident occurred 33 times in the 6608 births (1 in 200). There were 22 children born living (of whom 3 died in nine days), 7 were already dead at the commencement of the labour, and 4 died during its progress. Of the coinciding presentations, 19 were occipital, 2 face, 5 feet, 4 breech, and 3 cross. In 10 of the cases no interference took place, either because the child was dead, or (as in 3 of these the labour was so rapid as not to endanger it. In 11 cases *reposition* was employed, and 10 children were born alive, the forceps being required in the other case on account of the delay of the labour. Turning was employed in 6 cases, the child being born living in 3, being already dead in 2, and dying during the operation in 1. In 5 cases of foot, or breech presentation, the labour was completed by extraction, with the effect of saving the child's life. Comparing the author's proportion of prolapsed-funis cases, 1 in 205 with that of other observers, we find that Collins met with it once in 171 births, Hardy and M'Clintock once in 181, Lachapelle once in 411, Boivin once in 521, Bartsch once in 276, and Klein once in 100. —*British and Foreign Medico, Chirurgical Review, Oct.* 1851.

(*To be continued.*)

REPORT MADE TO THE ACADEMY OF MEDICINE ON THE SUBSTITUTION OF AN ARTIFICIAL IODISED OIL FOR COD LIVER OIL.

BY A COMMITTEE COMPOSED OF MM. GILBERT, RICORD, SOUBEIRAN AND GUIBOURT (REPORTER).

On the 20th of August, 1850, the Academy appointed the above committee to examine a memoir by M. Personne, Principal apothecary to the Hospital du Midi, entitled, *Researches on cod and skate liver oils, and preparation of an iodised oil capable of replacing them in medical use.*

On the 10th September following, a note on the same subject presented by M. Deschamps of Avallon was sent to the committee; and on the same day a note from M. Marchal, of Calvi, claiming priority of employing iodised oil of sweet almonds, as a substitute for cod-liver oil was also transmitted to us.

We now report to you on these three memoirs and the experiments by which their examination was accompanied.

Cod-liver oil has long been an article of considerable commerce owing to its marked superiority over the other animal oils for the preparation of chamois leather; but it has been scarcely 20 years in use in medicine. Employed at first in rheumatismal pains, then is laryngeal phthysis and successively against all forms of scrofulous affection and against phthysis pulmonalis, is now one of the most commonly used of therapeutical agents, and one of those on which physicians place most dependance, either for the cure of these formidable diseases, or for delaying for a shorter or longer period the fatal termination.

The most important memoir which has been published on the nature of cod-liver oil is that of Dr Jongh, which teaches us the composition of their commercial varieties, designated *black, brown and white cod-liver oils.* Of this great work we shall mention only that these oils have been found to be composed principally of oleic acid, margaric acid and glycerine, and, as accessory bodies, of butyric acid, acetic acid, of some principles belonging to the bile, of a yellow or brown non-nitrogenous coloring matter, called *gaduine,* iodine, phosphorus, and some inorganic salts. In France, M M. Girardin and Preisser have compared cod liver oil and skate liver oil, and have insisted on the superiority of the latter for medical use; but this superiority was partly founded on the fact that skate liver oil, when carefully prepared by pharmaceutists, transparent and of a golden yellow color, is much less repugnant to the patient than the cod liver oil of commerce, which was then generally turbid, blackish and of a very disagreeable taste. This is no longer the case. Recent experiments have likewise shown that little dependance is to be placed on the characters given for distinguishing the two kinds of oil on account of their variability.

According to MM. Girardin and Preisser, these oils contain iodine in the state of iodide of potassium, and the proportion of it is much smaller than found by Dr. de Jongh, who found in 1000 grammes

	gr.
Black Cod Liver Oil...	... 0·295 of iodine.
Brown...	... 0·406
White...	... 0·374

MM. Girardin and Preisser found per litre:

Skate Liver Oil... ..	... 0·150
Cod Liver Oil...	... 0·180

According to M, Gobley, a litre of skate liver oil, prepared by the direct action of heat, contains 25 centigrammes of iodide of potassium. M. Gobley has not been able to detect phosphorous in this oil.

Such were the principal analytical results known, when M Personne presented his memoir to the Academy. Their small amount of certainty and the great variations which are remarked in them, led that chemist to ask himself the following questions.

1. Do cod and skate liver oils contain iodide of potassium or iodine?

2. Do the various kinds of these oils contain the same quantity of iodine?

3. Do these same oils contain phosphorous, to which may be attributed, as some think, part of their properties?

To prove the presence of iodine, M. Personne saponifies the oil with an excess of pure potassa; he incinerates the soap obtained and treats the product of the incineration by alcohol of 90 degrees. He evaporates the alcohol, redissolves the product in water, and adds to it solution of starch and sulphuric acid. The intensity of the blue color enables us to judge of the quantity of iodine: it is always too small to be appreciated by the balance.

M. Personne has tested in this manner the deep brown and turbid cod liver oil employed in the hospitals of Paris; the transparent and almost colorless oil obtained from England, and skate liver oil prepared by the direct action of a moderate heat and filtration. The following are the conclusions drawn from his experiments:—

1. The brown cod-liver oil of the Paris hospitals contains more iodine than the beautiful white oil of English commerce.

2. It contains also more than skate liver oil, and yet it certainly contains less than a decigramme of iodine per kilogramme.

3. The residue of the preparation of skate liver oil contains much more iodine than the oil which has been separated from it.

We regret that M. Personne has not endeavoured to determine more precisely the quantity of iodine in the oils which he examined; for if this quantity is so small as he states, and which has also been found by M. Rabourdin, who fixes at only 28 milligrammes the quantity of iodide of potassium furnished by a kilogramme of brown cod liver oil, it becomes very difficult to attribute to iodine exclusively, or even principally, the well proved effects which cod liver oil promptly produces in scrofulous affections and phthysis pulmonalis. This may be said without diminishing the interest which attaches to the medical employment of an oil artificially charged with a much larger and a known proportion of iodine.

M. Personne likewise investigated the question as to whether the iodine exists in the oil of fish livers, in the state of direct combination with the other elements of the oil, or in that of iodide of potassium. Admitting that this question has appeared to ourselves very difficult to decide, we regret that he has not done so in a manner free from objection. Indeed, from the fact that a pommade made with fat and iodide of potassium, after being colored by oxygenation in the air and again rendered white by age, presents in the portion which has become liquid, filtered and transparent, a proof of the presence of iodine, it does not follow that this iodine is not combined with potassium, because there is no reason why a minute quantity of iodide of potassium may not be dissolved in the fatty body. We confess, however, that we are more inclined to think with M. Personne, and that we admit without difficulty the explanation which he gives of the manner in which the iodisation takes place. M. Personne having found that the tissue of the liver contained much more iodine than the oil, he considers that this iodine exists in the liver in the state of iodide of potassium; that this iodide is decomposed under the influence of the air and of the fatty acids formed during the preparation of the oil, and that the iodine acting then on the oil by substitution, is divided thus into two parts, one of which removes hydrogen from the oil and eliminates it under the form of hydriodic acid, and the other takes the place of the hydrogen. It is at least very probable, that if the iodine exists in the oil in the state of direct combination, that things occur thus. The search for phosphorus was made in the following manner:—

The oil saponified by potassa was mixed with nitre and submitted to deflagration, the product dissolved and saturated with hydrochloric acid was filtered, neutralised by ammonia, then treated with chloride of barium, which should precipitate phosphate of baryta. But neither cod nor skate oil gave a trace of it.

The residue of skate liver oil, resulting from the extraction of the oil, having been treated directly with nitre, and the alkaline product dissolved in hydrochloric acid, the filtered liquor immediately precipitated phosphate of lime by the addition

of ammonia. The author has omitted to say whether the filtered liquor was precipitated by chloride of barium.

Thus, if phosphorus has been found in some samples of cod or skate liver oil, this principle must proceed from the phosphate of lime contained in the attenuated debris of the liver, which are most frequently held in suspension in the oil. We have seen above that M. Gobley could not extract phosphorus from skate liver oil which he himself had prepared. There is, therefore, reason to think that phosphorus contributes nothing to the medical properties of these oils.

But however minute the quantity of iodine which exists in these animal liquids, it will be very difficult not to believe that this principle constitutes a great part of their properties, and seeing the very different quantities which have been indicated by chemists, M. Personne thought that it was useful to present to medicine a pure oil, combined artificially with an uniform and determined quantity of iodine. This oil will not, perhaps, replace cod liver oil in all cases,* but it cannot be doubted that, as a special agent, presenting the iodine combined with an assimilable substance, which makes it penetrate throughout the system, and gradually yields it thereto, in proportion as it is burned in circulatory apparatus, it becomes a powerful modifier of derangements of the lymphatic system.

To prepare the iodised oil, M Personne first dissolves 1 gramme of iodine in 100 grammes of olive oil or oil of sweet almonds. The liquid, which is at first of a deep color, gradually loses this color and resumes its natural tint in about thirty-six hours; it again becomes colored and acquires a brown tint which is removed by agitating the oily liquid with a weak solution of bicarbonate of potassa.

The oil on which the iodine has been made to act presents an acid reaction to litmus paper, and by treating it with bicarbonate of potassa, half the iodine employed is evidently removed from it in the state of hydriodic acid. The iodised oil retains the other half of it, that is to say, half a gramme in 100 grammes, or 5 grammes in 1000, or 175 times as much as cod liver oil according to M. Rabourdin. It is evident that this oil cannot be compared to cod liver oil; it is a different medicament, but may present great advantages in therapeutics, as will be seen from the experiments which we shall communicate to the Academy.

We may remark in passing that this circumstance of the division of the iodine into two equal parts, one of which is removed in the state of hydriodic acid, and the other remains combined with the oil, is a proof of the correctness of M. Personne's theory, namely, that the iodine is substituted in the oil, for one equivalent of hydrogen, which necessarily takes, in order to pass to the state of acid, a proportion of iodine equal to that which has produced the substitution.

Since the presentation of his Memoir, M. Personne, without changing the proportions employed, has modified the preparation of the iodised oil in the following manner.

He dissolves 5 grammes of iodine in 1 kilogramme of oil of sweet almonds, and then drives into the liquid a current of steam until it is completely decolored. This done, he adds 5 grammes more iodine, and continues the steam, until, as the first time, the liquid is completely decolored. It is also preferable to add the second quantity only by proportions at a time, in order to avoid the product remaining colored, in consequence of the action of the iodine on other principles contained in the oil.

In operating in this manner, no trace of the vapor of iodine, indicating its loss, is perceived. The water which condenses has a very acid reaction, due to the hydriodic acid It is decanted at once, and the oil is washed with a weak solution of bicarbonate of potassa or soda, until the acid reaction has entirely disappeared, finally, it is allowed to settle and filtered through paper.

* We distinguish three principal agents of the reparatory action which cod liver oil exerts in rachitic consumption, hæmoptysis, and phythysis pulmonalis : first iodine, which we cannot omit however small its quantity may be; the oily matter itself, which furnishes to the respiration the combustible element proper for sustaining the animal heat, without any expence to an emaciated body; and finally, the acrid and aromatic principle of the fish oil, a body perhaps more nearly resembling creosote than butyric or phocenic acid, which must be regarded as the preserving principle of chamois leather, and as the agent of the hæmostatic property of the oil, This principle is evidently absent in iodised oil of sweet almonds.

By adding new and fractioned quantities of iodine, twice as much, or even more, might be introduced into it; but whatever, precautions may be taken, it is difficult to avoid obtaining a deeply colored product.

When 40 grammes of medicinal iodised oil (containing 5 grammes of iodine in 1000) are taken into the stomach, iodine does not make its appearance in the saliva for an hour and a half.* The iodine manifests itself more and more during 12 hours, after which it diminishes; it is still perceptible after eighteen or twenty hours, and even after twenty-four hours; it disappears almost completely after thirty hours. This experiment, which is easily repeated, gives the measure of the time necessary for the destruction of the fatty body to commence in the circulatory system, and of that necessary for its complete destruction. Indeed it is only the destruction of the fatty body which can render perceptible in the system the presence of the iodine elementarily combined with it.—*Journal de Pharmacie et de Chimie*, September, 1851.—*Chemist, Nov.*, 1851.

(*To be continued.*)

PART FIFTH.

MISCELLANIES.

Extracted from an interesting Book called Physic and Physicians.

(*Continued from page* 191.)

Dr. Parr entertained an exalted opinion of the members of the medical profession. His father was a distinguished Surgeon; and he himself was destined for the same profession. He used to say his father was "a man of very rubust and vigorous intellect."

The family was very respectable, but lost the greater part of its property, and, in some measure, its importance, by persisting in its attachment to the declining cause of the Pretender. According to his own account, he had a very precocious intellect, and had obtained a considerable knowledge of the Latin language at the early age of four years. Once, when called from his boyish play to compound medicines, he showed his critical accuracy in pointing out to his father a mistake in the Latin prescription, which drew from the apothecary this authoritative injunction: "Sam d—n the language of the prescription—make up the mixture." An empty coxcomb, after having engrossed the attention of the company for some time with himself and his petty ailments, observed to Dr. Parr, that he could never go out without catching cold in his head. "No wonder," said the Doctor pettishly; "you always go out without anything in it." I cannot exactly perceive the scope of your argument, and therefore cannot adopt your opinion, said a gentleman, with whom Dr. Parr had been arguing. "Then, sir, I can only say you have the dulness of lead without its malleability." It may be curious, as well as interesting, to know what Dr. Parr's opinions really were on the subject of medicine, and the medical men with whom he so intimately associated.

* Its presence in the saliva was manifested by means of starch paste and sulphuric acid.

Of the learned professions, Dr. Parr considered the preference due, in many respects, to the medical. "Whilst I allow," says he, "that peculiar and important advantages arise from the appropriate studies of the three learned professions, I must confess, that in erudition, in science, and in habits of deep and comprehensive thinking, the pre-eminence must be assigned, in some degree, to physicians." Again he observes, "The most desirable profession is that of medicine: the practice of the law spoils a man's moral sense and philosophic-spirit; the church is too bigoted and stiff-starched; but the study and practice of physic are equally favorable to a man's moral sentiments and intellectual faculties." The Reverend W. Field, in his life of Dr. Parr, observes, "I have often heard him declare, that he considered the medical professors as the most learned, enlightened, moral, and liberal class of the community, and though he often lamented on the scepticism on religious subjects which some have shown; yet this, he thought might be explained on principles, which evince the strength rather than the weakness of the human mind, contemplating under certain circumstances the multiplicity and the energy of physical causes. But if the 'Religio medici' when weighed in the balance of the sanctuary, might, in some instances be found wanting; yet he consoled himself, he said with reflecting on the many instances in which there was certainly the deepest conviction of religious truth, not merely declared by an exterior profession, but displayed in all its best and happiest effects on the heart and conduct." "In support of our sacred cause" he would often say, "might we not triumphantly appeal to such illustrious names as those of Sir Thomas Browne, Sydenham, Boerhaave, and Hartley, in days that are past; and, in our own times, to those of Gregory, Heberden, Falconer, and Percival?"

There was no subject on which Dr. Parr delighted to converse more than on the character and pretensions of the great men, who, at different times, have appeared in the medical world. Speaking of the most distinguished of all the ancient physicians, Hippocrates, he said, that he had read much of his works, as much as any man in this country; and he thought that the duties of a physician were no more beautifully exemplified than in his conduct, or more eloquently described than in his writings. He often particularly noticed the attention which the great father of physic paid to the nature and properties of water, and its effects on the human frame. This he considered as a subject of far more importance to the medical practitioners than is commonly apprehended; and perhaps the observation was suggested to his mind by recollecting the laborious researches, directed to that very object, by his much respected friend Dr. Lamb, begun during his residence at Warwick, and continued many years after his removal to London. Celsus he pronounced "a very wise man," and said, "his works ought not

only to be read, but read night and day, by every medical student." His style, he said, is very good Latin ; and if it were not so, he ought still to be read for the medical knowledge which he communicates. Almost all that is invaluable in Hippocrates, he remarked, may be found clearly and beautifully epitomized in Celsus. In recommending to a young physician the study of Aretæus, a bold and decisive practitioner in the reign of Vespasian, whose works have ever been admired for the accurate description of diseases which they contain, and for the judicious mode of treatment which they prescribe, " Aye " said he, " if I could find one with a mind like Aretæus he should be my physician." Speaking of Dioscorides, distinguished no less as a botanist than as a physician, he said that he sometimes read his works, and always with pleasure. Though it is often difficult to translate his works, especially in the description of plants, Tournefort, Sibthorpe, and other travelling botanists have taken, he thought the only sure method of explaining the plants, both of Theophrastus and Dioscorides, by diligent researches in the countries where they were originally found. He looked upon Galen as decidedly one of the most learned men who have appeared in the medical world ; though inferior in other respects, especially as a pathological observer to Hippocrates or Aretæus. The poem of Frascatorius, the celebrated physician of Verona, in the eighteenth century being mentioned, Dr. Parr observed, that it was one of the most classical productions, which have appeared since the Georgics of Virgil ; with which, indeed, for its melodious versification, its vivid imagery, and its noble sentiments, it has often been compared.

Descending from the ancients to the moderns, he often spoke in praise of the literary acquirements and professional skill of Sir Thomas Browne, Sydenham, and Harvey ; but pre-eminently his favourite medical writer was Herman Boerhaave ; and upon his genius, his attainments, his important works, and his noble character, he was accustomed to expatiate, with almost rapturous delight. It was he that opened, Dr. Parr said, a new and splendid era in the science of medicine and chemistry ; and to his instructions delivered in his lectures and his writings, the wonderful discoveries and improvements of later years may be principally ascribed. Next to Boerhaave, the glory of the Dutch school of medicine, stood the contemporary and friend of Boerhaave, Dr. Mead, the illustrious ornament of medical science in England, who was eminently distinguished not only for his professional talent, but for his literary attainments, and for his fine taste in all the arts which adorn and improve human life. The Latin style of his works, Dr. Parr said, is entitled to commendation ; but, he added, though a good scholar, Dr. Mead was not skilful in writing Latin ; and was therefore obliged to borrow the aid of Dr. Ward and Dr. Leatherland.

In Dr. Friend he admired the man of profound erudition, as well as of extensive medical knowledge ; and in reading his works, he always met, he said, the deep thinking Philosopher, as well as the elegant writer, Sir George Baker he considered not only one of the best Physicians, but also one of the best scholars and writers of Latin of his day ; and readily yielded to him, in this last respect, the palm of superiority over himself. Dr. Akenside he extolled as a man of vast learning, as well as of high talent, but united, unhappily, to excessive pride. Cullen he thought a most extraordinary man, and said, that he once intended to write his life. In Dr. Aiken he acknowledged elegance of taste and high cultivation of mind. Dr. Heberden he called, " the amiable and accomplished author of the " Commentaries," or, the history of the diseases which came under his own observation, written in pure and flowing Latinity." Of Dr. Gregory, well known for his useful moral, as well as medical publications, Dr. Parr remarked, " that his writings are extensively read, and that they do credit to the ingenuity, the sensibility, and the piety of the author." With great and unfeigned respect, Dr. Parr cherished the memory of Dr. Percival, Dr. Arnold, and especially Dr. James Johnstone, of Worcester, whom he describes " as a man of much intellectual rigour and various research ;" but whose life fell a sacrifice, at the age of 30, to his humane and zealous discharge of professional duty, in visiting the prisoners during the period of a raging fever in Worcester gaol. No medical practitioner ever acquired, within the same space of time, a higher reputation than this young Physician ; and his virtues, talents, and the valuable services of his life, terminated under such affecting circumstances by his death, have secured for him a place in the grateful remembrance of the city in which he lived and died and of all to whom his name and his merits were in any degree known. A monument to his memory was erected in Worcester Cathedral, for which the inscription in Latin was written by Dr. Parr.

Of the members of the medical profession whose friendship Dr. Parr cultivated whilst living, and whom he enumerated in his " last will" amongst the number of his friends, are, Dr. E Johnstone, and Dr. Mole, of Birmingham, Dr. Lambe, Dr. Bright, and Sir Anthony Carlisle of London ; the latter of whom he designates, as a skilful surgeon, a profound philosopher, a most animated writer, and a most valuable friend. Among his friends, he also enumerates, Dr. Hill, of Leicester, Dr. Browne, of Coventry, and his own medical attendants, Dr. J. Johnstone, Dr. A. Middleton, Mr. Blenkinsop and Mr. Jones. In the same solemn registry, he has recorded the high value at which he prized the friendship of the very learned scientific and truly pious Dr. Falconer of Bath ; and of the eminently distinguished Dr. Holme, " who, says he, in sincerity, in uprightness, in professional skill, in taste for read-

ing classical authors, and in the knowledge of chemistry, zoology, and English antiquities, has few equals among his contemporaries."

How extremely gratifying it is to the members of a profession who have to struggle against the unreasonable prejudices of the world, to have this testimony in their favour pronounced by one of the most learned scholars of his day.

To be the instruments, however humble, of increasing the happiness of others, is of itself a sufficient reward to the right thinking man, and to have the commendation of those who are considered to rank among the great and good, to be praised by those whom all men exalt, affords an additional and a higher gratification to the conscientious and upright physician.

A wise and witty author has truly observed "that the hope of gain and lucre, and different employments of men, shape them into a variety of strange forms." In the sixteenth and part of the seventeenth century, the learned professions were distinguished by a number of absurd customs, and carried the affectation of superlative wisdom to a ridiculous extreme: their garb, gait, and gestures were grotesque, and resembled those of magicians and conjurors: the physician was disfigured under a grave and solemn countenance: he was capaisoned in an enormous wig, a full-trimmed coat, buttoned to the bottom, and other extravagant paraphernalia. The introduction of more liberal ideas, above all, dramatic satire, enforced by stage exhibitions, have contributed to free the profession from this scholastic pedantry and stupid pomposity; to banish from science dunces and artful cheats, concealed under the mask of wisdom and cloak of gravity. The pensive look is now less studied, and the manners have become less stiff and supercilious.

> Physic of old, her entry made,
> Beneath the immense full bottom's shade,
> While the gilt cane, with solemn pride,
> To each sagacious nose applied,
> Seemed but a necessary prop,
> To bear the weight of wig at top.

The wig in former times, was looked upon as no inconsiderable dart of the insignia of a medical man, whose costume was completed by a full dress suit, &c.

> Each son of Sol, to make him look more big,
> Had on a large, grave, decent, three-tailed wig.

With the polished Reynolds departed the last silk coat among the doctors. The gentlemanly Samuel Howard, and the neat Dick Grindall, bore the last remnants of chirurgical costume; and, with Devaynes and Dalmayhoy, expired the magnificent peruke which characterized the "*Opifer per orbem.*" Even in the middle of the last century, so much importance was attached to it, that Dr. Brocklesby's barber was in the habit of carrying a band-box

through the High Change, exclaiming, "make way for Dr. Brocklesby's wig!" But of all things the most renowned was that of Dalmayhoy, which was celebrated in the song beginning,

If you see a noble wig,
And in that wig a man look big,
To Ludgate-hill repair my joy,
And gaze on Doctor Dalmayhoy.

The eccentric character gave rise to the following clever and humourous verses.

"Dalmayhoy sold infusions and lotions,
Decoctions, and gargles, and pills;
Electuaries, powders, and potions,
Spermaceti, salts, scammony, squills.

Horse aloes, burnt alum, agaric,
Balm, benzoine, blood-stone and dill;
Castor, camphor, and acid tartaric,
With *specifics* for every ill.

But with all his specifics in store
Death on Dalmayhoy one day did pop;
And, although he had doctors, a score,
Made poor Dalmayhoy shut up his shop."

GENERAL ORDERS.

MISCELLANEOUS.

G. O. C. C., 28th February 1852.—Surgeon W. G. Davidson, doing duty 2d Battalion Artillery, will proceed in Medical charge of the D Company of that Battalion and the D and A Companies of the 3d and 4th Battalions of Artillery, under orders to proceed on service.

The undermentioned Medical Officers and Subordinates will do duty with the Detachment.

Assist. Surgeon C. Smith, M. D., d. d. 2d Battalion Artillery.
2d Apothecary W. Peppin, 2d Battalion Artillery.
Assist. do. J. Hargreaves, 5th do.
2d Dresser J. Isacke, No. 157, 2d do.

Assistant Surgeon W. H. Boutflower, is appointed to the medical charge of the A and E Companies of the Sappers and Miners under orders to embark for Foreign Service.

The undermentioned Medical Subordinates will do duty with the Detachment.

2nd Dresser M. Juggernad, No. 226, Dispensary, 2d District.

2nd Dresser Ninapreiagosum, No. 126, attached to the General Hospital, doing duty in the Civil Hospital at Nellore, will proceed to rejoin the General Hospital on being relieved by 2nd Dresser Govindoo, No. 111.

G. O. G. 12th March 1852, No. 46.—Assistant Surgeon Colvin Smith, M. D., is permitted to enter on the general duties of the Army.

G. O. C. C. 4th March 1852.—Assistant Apothecary D. H. Gray of the Sappers and Miners, who arrived with the A and E Companies of that Corps from Mercara, is appointed to do duty with the Detachment, which he will accompany to Moulmein.

G. O. C. C. 8th March 1852.—With reference to G. O. C. C. of the 28th ultimo, 2d Dresser Ninapreiagosum, No. 126, attached to the General Hospital, will, on being relieved from doing duty in the Civil Hospital at Nellore, proceed towards Ongole and relieve Assistant Apothecary F. Pearl of the Superintending Surgeon's Department, H. S. Force, from the medical charge of the sick details of the Artillery and 2d E. L. I. en route from Secunderabad, proceeding with them to St. Thomas' Mount and Palaveram.

G. O. C. C. 10th March 1852.—Surgeon W. G. Davidson, A. M., proceeding in medical charge of the artillery, is appointed to the charge of the Medical Stores to be embarked for the use of the Madras Division proceeding on Service, and Assistant Apothecary G. Brown, attached to the Female Asylum, is appointed to do duty under the above officer.

Assistant Surgeon J. Thompson, now at Poonamallee, is appointed to the charge of, and the undermentioned Medical Subordinates are appointed to do duty under him in, the Field Hospital to be established at Amherst.

2d Apothecary G. Fonsworth, 4th Battalion Artillery.

Assistant do. S. B. Kemp, Superintending Surgeon's Department, Presidency Division, proceeded to Moulmein on Command.

2d Dresser Loganaudum, No. 123, Triplicane Dispensary.

G. O. C. C. 11th March 1852.—With reference to G. O. C. C. of the 28th ultimo, Assistant Apothecary S. Newman of the Superintending Surgeon's Department Centre Division, is appointed to do duty at the Female Asylum, until further orders—To join immediately.

Assistant Apothecary H. Powell, of the 41st Regiment N. I, now at the Presidency on leave, is appointed to do duty with the 5th Regiment Artillery—To join.

G. O. C. C. 12th March 1352.—2d Dresser Vencatasawmy, No. 81, attached to the Depot at Poonamallee, is appointed to afford medical aid to the Detail of H. M.'s 84th Regiment under orders to proceed from Poonamallee to Trichinopoly, until relieved by a Medical Subordinate from the Southern Division.

G. O. G, 16th March 1852, No. 48—Assistant Surgeon J. A. Cox, M. D., is permitted to enter on the general duties of the Army.

G. O. C. C, 15th March 1852.—2d Dresser Iyasawmy, No. 296. of the 11th Regiment N. I. now at the Presidency, is appointed to do duty at the Dispensary, 2d District.

1st Class Native Medical Pupil Nathamonee, No. 350, is removed from doing duty General Hospital to do duty at the Triplicane Dispensary.

G. O, C. C, 22d March 1852.—With reference to G O C. C. of the 8th November last, 2d Dresser A. Ramasawmy Naidoo, No. 153, of the Superintending Surgeon's Department Southern Division, will proceed to rejoin his Department at Trichinopoly on the arrival at Jackattalia of the Department H. M. 84th Regiment, now under orders to proceed to that place.

G. O. C. C. 24th March 1852—Assistant Surgeon G. E. Aldred M. D., of the E Troop Horse Artillery now at the Presidency, is directed to report himself immediately to the officer Commanding the Steam Squadron in the Madras roads, for the purpose of doing duty on board the H. C's Steamer "Zenobia," in the room of Assistant Surgeon Crawford proceeding to Bombay for the recovery of his health.

Apothecary G. R. Fox of the Senior Surgeon's Department Tenasserim Provinces, now at the Presidency, is appointed to afford medical aid to the Karkhana Establishment under orders to proceed to the Burmese Coast on the "Rockcliff."

G. O. C. C. 27th March 1842.—The G. O. C. C. dated the 18th February 1852, cancelling the unexpired portion of leave on medical certificate granted to Assistant Apothecary J. Pollett of the 1st Madras Fusiliers, in G. O. C. C. 24th May 1851, and 31st January last is cancelled, and that individual is granted an extension of leave until 20th April 1852, to enable him to join.

The dates of rank of the undermentioned Officers are affixed as indicated against their names.

Assistant Surgeon Fred. Jas. Windus, 20th October 1851.

" " Col vin Smith, ... 3d November 1851,

REMOVALS AND POSTINGS.

MEDICAL OFFICERS.

G. O. C. C. 28th February 1852.

		From	To
Asst.-Surg.	G. D. Gordon, M. D.	... .	9th Regt. N. I.
do.	G. Mackay, M. D	.....	35th do.
do.	J. Brett, M. D., 35th Regt.	N. I.	13th do.
do.	J. R. Theobalds, 9th do.	.....	52nd do.
do.	W. A. Jacob, 52nd do.	.....	Do duty Supg. Surg. Dept. Ceded Districts.
do.	J. Chisholm, 23rd do.	L. I.	do. Saugor Divn.
do.	H R. Oswald, M.D. 13th do.	N. I.	Do. Southn. Divn.
do.	J. T. Williams, d. d. 2d	E. L. I.	Do duty 9th Regt. N.I.
do.	J.A. Cox, M. D. d. d. H. M.'s 51st	L. I.	do, 35th do.

G. O. C. C. 13th March 1852.

Surgeon J. Supple, ... 21st Regt. N. I..... 12th Regt. N. I.
Asst.-Surgeon J. R. Theobalds, 52d do. 21st do.

MEDICAL SUBORDINATES.

G. O. C. C, 28th Feb. 1852.

Assistant Apothycary S. Newman, from Superintending Surgeons Department Centre Division to do duty 5th Battalion Artillery.

2nd Dresser Govindoo, from No. 111 Dispensary North side of Black Town, to do duty in the Civil Hospital at Nellore during the absence of 2nd Dresser Moonesawmy Naidoo, No. 130.

2nd Dresser Appavoo No. 217, from H. M.'s 51st L. I., to do duty 2d Battalion Artillery.

Do. Madoorasawmy No. 175, from Lying in Hospital Presidency, to H. M.'s 51st Light Infantry.

G. O. C. C, 19th March 1852.

1st Dresser Rungayah No. 74 from Chintadrapettah Dispensary to Zillah of Rajahmundry to remain at the Chintadrapettah Dispensary until relieved.

Paid Candidate T. W. Higgins from d. d. Dispensary at Ootacamund to do duty H. M.'s 84th Regt. and to join the Detachment of that Corps on its arrival at Jackatalla.

G, O, C, C, 23rd March 1852,

Assistant Apothecary A. White, from 2nd Native Veteran Battalion, to do duty 1st Madras Fusiliers.

Senior Medical Apprentice H. Crawford, from doing duty 1st Madras Fusiliers to do duty 2nd N. V. B.

APPOINTMENTS.

G. O. G. 2d March, 1852, *No.* 41.—Assistant Surgeon Alexander Hunter, M. D. to act as Medical Storekeepers at the Presidency, during the absence on Sick Certificate of Surgeon T. O'Neill or until further orders.

Assistant Surgeon Hugh Francis Clarke Cleghorn M. D., to act as Surgeon of the 1st District, during the employment of Assistant Surgeon A. Hunter, M. D. on other duty, or until further orders.

G. O. G. 5th March, 1852, *No.* 43.—The Services, of Assistant Surgeon J. Donaldson, M. D. were under date the 20th February 1852, placed by the Government of India at the disposal of the Resident at Hyderabad for employment in the Nizam's Army.

LEAVE.

MEDICAL OFFICER.

G. O. C. C. 13th March 1852.

Assistant Surgeon J. Brett, M. D., 13th N. I. from 6th March 1852, to 6th May 1852—Presidency.

G. O. G. 19th March 1852, *No.* 51.

Assistant Surgeon W Aitken, M. D., of the 18th Regiment N. I., is permitted to proceed to Calcutta on medical certificate for the purpose of obtaining a final certificate to enable him to return to Europe.

MEDICAL SUBORDINATES.

G. O. C. C. 28th Feb. 1852.

Apothecary T. Chillingsworth, Pen. Est., from 15th March 1852, to 30th June 1852—Bangalore.

Asst. Apothecary C. Robertson 11th Regt. N. I., from 12th Feb. 1852, to 15th March 1852—Vizagapatam s. c.

G. O. C. C. 6th March 1352.

Apothecary H. Eason, Pension Establishment, from 15th March 1852, for 6 months—Bangalore.

Assistant Apothecary J. Lears, 22d N. I., from 15th March 1852, to 15th September 1852—Vizianagram.

PROMOTIONS.

G. O. G. 12th March 1852, *No.* 46.

Assistant Apothecary G. Brown, to be an acting Second Apothecary from the 11th March 1852.

G. O. C. C. 1st March 1852.

3rd Class Native Medical Pupil P. Rungasawmy, No. 392, to 2nd Class Native Medical Pupil, from the 15th February 1852, vice R. Vencatasawmy No. 347, —Deceased.

G. O. C. C. 2d March 1852.

2d Dresser Baubba Saib, No. 16, to be 1st Dresser from the 1st March 1852, vice Govindoo, No. 63, pensioned and posted to the Zillah of Malabar.

ENTERTAINMENT AS 3RD CLASS NATIVE MEDICAL PUPIL.

G. O. C. C., 1st March 1852.

Ramsunnassee No. 412, from 15th February 1852—to do duty Dispensary 2d District.

PART FIRST.

ORIGINAL COMMUNICATIONS.

TO THE EDITOR OF THE "MADRAS JOURNAL OF MEDICAL SCIENCE."

SIR,—I beg to forward for insertion into the journal, the details of a case of cholera successfully treated in the General Hospital, with a few remarks suggested by it. So many works have been written on the subject, and such a variety of opinions have been promulgated, that a medical subordinate can scarcely be expected to be acquainted with them all. In the following pages, I have endeavoured to lay before my readers, in as condensed a form as possible, most of what has been published on the subject. I have made free use of every information which I could procure, and if I have objected to any of the theories advanced, it is because I believed them to be irreconcilable to known facts. My own opinions I have given with deference, but yet with the firm conviction of the honesty of my purpose, and the propriety of my data. With every wish for the success of so necessary and laudable an undertaking as that of the journal of which you have the conduct,

I remain, sir, your most obedient servant,

Madras, 21st Feb., 1852. W. BAKER.

NOTES FROM CLINICAL JOURNAL,

BY STUDENT W. BAKER.

CHOLERA.

Moodeen Sherriff, Æt. 30, Sepoy, 35th Regiment N. I., admitted 22nd January, 1852, at 4 P. M., complaining of frequent vomiting and purging with spasms in the lower extremities.

Pulse very small and quick; tongue coated and pale; eyes sunk; countenance expressive of anxiety; extremeties cold.

The patient states that, at 11 A. M., he felt sick at stomach, giddiness and general indisposition. The vomiting and purging then commenced, and have continued ever since.

℞ Calomel gr. x. Opium gr. ij. misce. To be taken immediately with the following draught.

℞ Spts. ammon. ʒj.

Mist. camphoræ ʒiss. misce.

The medicines were rejected almost immediately, and were repeated in half an hour, with a similar result. The spasms are very troublesome.

To have frictions with turpentine and laudanum to the affected parts, and a mustard poultice to the pit of the stomach.

3 P.M.—Pulse scarcely perceptible, extremities colder, voice failing.

Repeat calomel and opium.

℞ Sodæ carbonas ʒiss.

Water lbiss. Misce fiat mistura.

Half an ounce of this mixture with the same quantity of brandy to be given every half hour.

7 P. M.—Medicine retained; one rice-water like stool at 6 P. M. Pulse imperceptible—spasms violent.

Continue Medicine, &c.

9 P.M.—Complains of a sense of constriction across the chest; skin cold and clammy.

Continue Medicine, &c.

11 P.M.—Vomited several times since last report; other symptoms as before.

Continue Medicine, &c.

23d Jany., 1 A.M.—Complains of pains along the spine. Respiration difficult; voice indistinct; one rice-water like stool at 12 o'clock; other symptoms as before.

Continue Medicine, &c.

5 A.M.—Vomited twice since last report; Skin warm; pulse small and frequent.

Omit brandy.

Continue soda as before.

7 A.M.—Vomited three times and purged twice since last report. Pulse and skin slowly improving; no urine passed since 11 A.M. yesterday.

℞ Calomel gr. x.

Opium gr. i.—misce. To be taken immediately.

Continue soda without the brandy.

Hot bath.

23d Jany., mid-day.—One rice-water like stool since last report. Pulse and skin regularly improving; no urine passed yet.

R Spts. æther. nitr. ℥j.

Mistura Camphoræ ℥ijs. misce. To be taken immediately.

To have conjee with port wine; mutton broth in small quantities.

Vespere—Dozed frequently, appears easy. Had two stools of the usual rice-water appearance; Pulse small and quick; skin warm and covered with perspiration; no urine passed yet.

R Calomel gr. x.

Opium, gr. i misce. To be taken at bed time.

Continue conjee with port wine.

Midnight.—Passed about 4oz. urine at 7 and an equal quantity at 9 and 11 P.M.;—two small watery stools since last report—dozed frequently. Pulse and skin becoming more natural.

24th Jany. One watery stool since last report—passed urine once and slept a little; complains of pains all over the body. Pulse more regular; skin warm and moist.

To have effervescing draughts every hour.

Continue wine and conjee.

Vespere.—The patient feels comfortable; his pulse and skin are nearly natural; he vomited and purged two or three times to-day; the dejections indicating slight activity of the liver.

He took at mid-day.

Pil. hydrag. and Extract. Colocynth. *a a* gr. v. in pil.

Continue effervescing draught as before.

23rd January.—Continued to improve till about 12 o'clock last night, when the vomiting and purging again became very troublesome; the effervescing draughts were then omitted. To have the following.

R Calomel gr. v.

Opium gr. i in pil.

The patient vomited and purged twice since taking the pill. The stools are becoming more healthy.

26th January.—Has had four or five liquid yellowish brown stools, since last report. The stomach continues to be very irritable, vomiting occurring after each time that the conjee was taken. Complains of a pricking sensation and pain all over the body; has been restless; urine passed frequently. Complained last night of severe pain and ringing in the ears.

27th January.—No vomiting or purging since last report. Pulse

and skin natural. Complains only of general debility and muscular pains.

R Ol. Ricini ʒvj

Tinct. opii. M. x. misce. To be taken immediately.

28th January.—Bowels opened five or six times by the oil; the stools being liquid, brownish green and feculent. In other respects as before.

From this date nothing occurred to interrupt the cure. The patient slowly regained his health and strength, and he is now convalescent.

REMARKS.

No subject in the whole range of medical science has excited a greater interest than cholera. Whether we regard its prevalence or fatality, or the mystery which envelopes its nature and source, we are equally compelled to admit, that it commands a degree of attention which places it above the more common topics of enquiry. Consequently, views have been promulgated regarding its nature—volumes have been written upon the subject; and plans of treatment have been recommended equally numerous and varied; and, withal, we are nearly as ignorant of the essentials of the disease, as when it first presented itself to our notice.

With such facts before us, we might well shrink from any endeavour to elucidate what has baffled so many, and content ourselves with an idiotic astonishment at its mystery; but as it is absolutely necessary that a medical man should possess some definite ideas of a disease which, in all probability, he will frequently have to treat, no apology need be given for an attempt to accomplish, what is of such essential importance. "The mines of truth are often laid bare by the forked lightning of chance," and some fortunate speculator, may yet stumble over a clue to the mystery. At any rate, an enquiry like the present is useful, as giving employment to one's reasoning faculties, and as such it should not be neglected, although experience has proved that a great deal of what has been written and said on the subject has not contributed to enlighten us. Yet as coming from such high authority, and supported by so much ingenuity and ability, they deserve the attention of all who engage in the enquiry.

The principal points which have engaged attention, are—

1st.—Its History.

2nd.—Its exciting cause.

3rd.—Its mode of development and the means by which the disease manifests itself.

4th.—Its treatment.

Each of these points will form the subject of a few remarks.

1st—Its History.—Some* contend for its existence in very remote times; and to prove their assertions, cite passages from the writings of Celsus, Hippocrates, Paulus Ægineta and other ancient authors: from these quotations, it appears to me, that the disease of which they treat, is neither more nor less than indigestion produced by the usual causes, and I cannot see how they could possibly have been confounded with epidemic cholera, as it exists at the present day. Cases of sporadic cholera, no doubt existed then as now; but even if so desolating a disease did then exist, we certainly have no proof of it. Some ambiguous expressions in the writings of the Jews and Hindoos, have been forced into a similar interpretation and with the like effect. I know of no proper objection to the fact of its being a disease, whose origin exists within the memory of man. Is the formation of morbific agency of such entire improbability, as to induce us to force facts to oppose its possibility? I believe not: vomiting and purging did exist from the earliest times, as did sores on the genitals, but their specific property has been acquired since then.†

2nd—Its exciting cause.—Of all points connected with cholera, this has been the most contested. Each author has had his hobby, on which he has ridden roughshod, over those of all others; but they may all be arranged under six principal heads.

"1st.—Direct irritants to the alimentary canal.

2nd.—Atmospheric vicissitudes.

3rd.—Various meteorological phenomena.

4th.—Malaria.

5th.—Several concurrent causes to the exclusion of any single one.

6th—An unknown cause."

Dr. Knox from whom this classification is quoted,‡ admits the first of these, and discards the other three; but he does both without sufficient reason.

The alimentary canal is certainly irritated; but by what? By no or-

* Mr. Bushnan, "Cholera and its Cures," p. 16.

† It is unnecessary to enter into any further controversy on this subject. Nearly all that can be said on either side has been advanced by the opposite parties and the reader can make his own deductions. It is an immaterial point in the disease itself.

‡ Bushnan.

dinary irritant, by nothing tangible; consequently even admitting the fact, we are as far as ever from the object of our search.

2nd.—Atmospheric vicissitude can have little or nothing to do with the production of cholera. The disease raged with equal violence on the sun scorched plains of India, and the snow clad plains of St. Petersburgh.

3rd.—Meteorological phenomena have no doubt some influence in the production of the disease; but our limited knowledge of them and of their relation to the effects which have been known to follow their occurrence, precludes the possibility of any positive deduction from this source. It has been asserted by many, that the electricity which usually exists in the atmosphere, is altered in quantity and quality during the existence of epidemic cholera* and that the disease owes its origin to the effects of this alteration upon the system. Electricity is a powerful stimulant, and when deficient, or so changed in its relations, as to become unfitted for its usual purpose, we might naturally infer that a corresponding depression will exist in the human frame. Under this head may be mentioned a few other circumstances which have been noticed. "Professor Webb believes; that of all causes of cholera, an atmosphere impregnated with sulphuretted hydrogen is the most potent."† Dr. Clannie mentions several instances in which previous to an outbreak of cholera, in particular places, sulphur was showered from the atmosphere.‡ An anonymous writer in the "*Morning Chronicle*" states, that, during the prevalence of cholera, the atmosphere does not contain its proper proportion of ozone§—"an oxide of hydrogen, the product of electrical action." To those and other such theories it may be objected, that they are not constant, they cannot be regarded as the exciting cause of epidemic cholera, though from their connection with the electrical condition of the atmosphere, they may have some influence as predisposing agents.

4th.—Malaria has been stated to be the exciting cause of the disease. "By Malaria is implied any noxious change occurring in the atmosphere, whether from chemical action or additions to its ordinary constitution, from whatever cause arising; whether dissolved or merely floating in it; such as the emanation from decaying animal and vege-

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* Dr. Chambers, Mr. Orton, Mr. Blacklock, Mr. Andrance, Mr. Wilkinson, and some other authors have promulgated these views.

† Bushnan.

‡ Clannie on cholera.

§ Bushnan.

table matter, mineral effluvia, invisible animalculæ, or morbific vegetable germs''* This definition of Malaria is given by Dr. Knox, and it is the most correct and comprehensive yet published; the objections to this as being the cause, on the plea of its prevalence "in particular parts of the country, to the exclusion of another, or what is still more remarkable, on one side of a street, one part of a barrack or square, or in a single vessel of a fleet.†'' This objection is easily answered and may be illustrated by the process of chemical combination. One substance will combine with another, but this must be first brought into a certain condition to ensure the influence of the combining forces. And again, in order to affect the attraction of electric powers, they must exist in opposite conditions—one must be positive and the other negative; and thus, it may be argued, that the system must first be reduced to a certain condition or the choleraic virus will otherwise fail in producing any effect upon it. Individuals living on one side of a street or barrack, &c. are generally of the same condition in life, and exposed to similar predisposing circumstances, and consequently are equally obnoxious to the exciting cause of the disease.

5th.—Several concurrent causes to the exclusion of any single one. This opinion is supported by many, and it is so far correct, inasmuch, as many concurrent causes must first reduce the system to that condition which is essential to the development of cholera. Filth and a bad constitution will predispose a person to a syphilitic affection, but the contact of the specific poison is necessary to its consummation. Sores on the genitals are often produced by long continued uncleanliness; but a real venereal chancre never occurred in this way. And in like manner, deficient and improper diet, exposure to atmospheric inclemencies, dissipation, &c. will produce disease, but not cholera. Professor Blacklock accuses "the continual use of a diet deficient in sulphur as the remote cause of asiatic cholera.'' Another gentleman has brought a similar charge against rice diet.‡ If Professor Blacklock's

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* Bushnan.

† I know of a similar instance in a place not thirty miles from the Presidency, that portion of it occupied by Europeans and their families has remained free from the disease, during many seasons in which the native population, not fifty yards distant, suffered severely. Now what is the proper and natural explanation of this circumstance? The European population from their manner of living, &c. were not predisposed to the disease as the others were, and consequently they escaped.

‡ Quoted by Dr. Prother de Smith.

theory be correct, we have always in hand a ready means of at least preventing the disease, and as such, it is entitled to a close investigation.

6th—An unknown cause.—We are pretty safe in ascribing it to an unknown cause, seeing that we can fix upon no one of certain and universal application ; but we are nevertheless bound by the claims of the profession, and the interests of humanity, to do our best, to arrive at a satisfactory conclusion.

After a careful consideration of all these theories, I am disposed to believe, that an altered electrical condition of the atmosphere cannot of itself produce cholera, though it may reduce the system to that condition in which the choleraic virus will have effect. But this is not the only source of predisposing influence. Anything that alters the electrical condition of the body itself, be it a deficiency of proper diet exposure to inclement weather, mental excitement, &c., will have the same effect. I further believe that the choleraic virus exists in the atmosphere,* and is produced by an altered molecular relation of its ultimate or accidental components, induced by electrical or chemical affinity. What this alteration essentially is we do not, and will not know, until science has made further advances. With this view of the subject, I am naturally inclined to believe that in course of time, the force, which generated the choleraic virus, will in virtue of the continual though invisible change in the occult materials of the universe,† become either expended or so altered, as to produce some other condition, which may be either less or more deleterious than the present.

We now come to the third proposed subject of enquiry, viz. Its mode of development, and the means by which the disease manifests itself, and as might be expected, this too has been a subject of much controversy. Some consider that the contaminated air is breathed by the lungs and thus taken into the system ;—others again regard the food and drink as the usual menstrua : and Dr. Snow favors water, and not content with this, regards it as actually "the sole and independant source of the disease," in cases occurring in London. He supposes

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* Dr. Adair Crawford conceives that, "It is difficult to draw any other conclusion from its irregular, capricious, and rapid progress over large regions of the globe, than that cholera originates from some latent influence of the atmosphere on the functions of animal life, and that this influence is probably of a similar nature to those by which blights are produced in the vegetable kingdom ;" he adds "That it is an epidemic propagated by atmospheric causes, &c."—*Bushnan.*

† If my recollection serves me, Dr. Prout has glanced at this theory in one of the "Bridgewater Treatises."

that the intestinal fluids so largely excreted in cholera contain the special poison"* and that this becomes accidentally mixed with the water, which when taken into the system "immediately begins to exert its baneful influence." This theory contains its own contradiction, for how did the first case of cholera occur, and in what manner was the "special poison" generated before it got into the well? If Dr. Snow had extended his observation to other places than London, he would have found ample reason to conclude that the water (which in that place is certainly very much contaminated) could have no other effect than that of a predisposing agent.

Bearing in mind that the choleraic virus is disseminated in the atmosphere, it is but natural to infer that every thing exposed to atmospheric influence, contains more or less of it. The air we breathe, the food and drink upon which we subsist, are alike exposed to its contamination and it gets into the system by any, or all of these means. It is thus brought into direct contact with the ganglionic nerves supplying the viscera, altering their condition and power, and thus producing a morbid change in the secretions of the various organs. As a consequence, the blood becomes contaminated and carries the contamination with it to all parts of the body. These changes are gradual. There is a period of incubation in this as in all other specific diseases, which Dr. Clannie states to be about five days. At the end of this time, the contamination has reached its acme, and the vital powers sink exhausted before it. The heart's action is impeded by the influence of the poisoned blood upon the nervous centres. The blood is congested, and then follows the train of formidable symtoms which I shall now endeavour to explain.

(To be continued.)

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* Drs. Brittan, Swayne, and Budd, fancied that they had discovered "peculiar microscopic bodies in the choleraic discharges" and in the water and air during the prevalence of the disease; but it has been since observed that they are not peculiar to choleraic discharges, that they are not "universally or even generally found in the water of infected districts," and that their existence in the air, has not been confirmed by a single individual.—*Bushnan.*

ARTICLE II.—*Remarks on Cracked Feet.* By Assistant Apothecary G. O'HARA.

(Xeroderma Ichthyoides.)

This is an affection familiar to the Madras Sepoy, and known to his Medical attendant; it occurs more frequently on the march and in cold weather. At first these cracks or fissures are confined to the tough hard integument; but soon penetrate to the soft parts when they produce much suffering.

What is good for cracked feet has often been asked. Rest, unctuous applications, steeping the feet in water, and a host of other measures are adopted with only temporary relief; but it sometimes proves so obstinate, that patients are detained for months in hospital, and have been in many instances, disabled for further service.

The complaint, though trifling in a practical point of view, is often the cause of an hospital being unnecessarily yet unavoidably filled.

Prevention is said to be better than cure, so cracked feet are to be prevented and cured only by substituting boots or shoes for the slipper or sandal now in use among the sepoys. The result of this substitution will at once be obvious, when we notice the entire immunity from the complaint in Cavalry Regiments and in other Corps where the system is adopted. About two thirds of the cases marked in the returns, as contusions and ulcers, are cracked feet, or some injury caused by the present slipper These cases of cracked feet, besides forming a long string of stragglers, must be great obstacles to a Regiment when required to make forced marches. We know of no objections which can be raised to this improvement, the cost and wear will be much the same if not advantageous, and for the purposes of running and escalading more suited—and the change no doubt will be much appreciated by the native army.

ARTICLE III.—*A case of Vesico-vaginal fistula with closure of the Vagina.* Communicated by Assistant Apothecary J. SHORTT.

Cassim Bee, Æt. 30, mother of several children, presented herself complaining of inability to retain her urine owing to a false passage. On examination with the speculum, the vagina about 1½ inch from the vulva was found to be completely closed by the adhesion of its walls,

½ an inch from the meatus urinarius there was observed on the anterior wall of the vagina an opening which allowed the point of a little finger being passed through and communicating with the bladder; the margin of the opening was puckered and callous.

The patient was in the enjoyment of good health, but her countenance was bloated and complexion sallow; she had not menstruated since she gave birth to her last child, still-born, 9 months ago, when she suffered much from it being a difficult labor, immediately after, the whole vagina was in a state of ulceration, but gradually healed leaving her in her present state.

It was proposed that the hardened edges of the fistulous opening should be pared, the parts kept in apposition with a view of bringing on adhesion, that she was to lie on her belly and retain a catheter in her bladder. But to this treatment the patient refused to submit and she was dismissed.

Remarks.—On consulting several authors on female diseases—viz., Ashwood, Churchill, Graham, Hamilton, &c., I could find no account of a similar case of occlusion of the vagina. Churchill on child-bed and pregnancy, at page 398, refers to a case where M. Vidal de Cassis accidently excited inflammation and adhesion of the vaginal walls, and had in this manner nearly succeeded in curing a vesico-vaginal fistula, but through the carelessness of his assistant the adhesions were broken up. In the present case, there was every hope of success, as the parts were in constant apposition, it required only adhesive inflammation to be excited, and the urine prevented from passing through the fistula by the constant use of a catheter.

If the fistula were cured, the vaginal canal could have easily been restored by either cutting or tearing through the adhesion of its walls. The most remarkable feature in this case is, that notwithstanding the patient did not menstruate for 9 months, she continued in the enjoyment of health; nor did there appear to exist any distention of the uterus at the time she presented herself for relief.

ARTICLE IV.—*Case of attempted Suicide—Recovery.* Communicated by Assistant Apothecary J. MARTIN, 38th Regiment N. I.

A Sepahi of the Regiment requested me to see his wife who, he said, was in a dangerous state, in fact dying, from having taken a quantity

of opium. On arriving at his place in the lines, I found the subject of these notes to be a young mussulmanie woman, about 17 years of age—prostrate, quite helpless and insensible, pupils contracted and insensible to light, countenance placid and ghastly, pulse slow, small and weak, saliva dribbling away from the mouth, respiration slow and scarcely audible, skin cold and perspiration about the forehead and face. Finding from the urgency of the symptoms, there was no time to be lost, and as the patient was unable to swallow an emetic, I had recourse to the stomach pump and pumped in a large quantity of water, until the stomach was made to act by regurgitation; this was continued until the water returned colorless and without any appreciable odour of opium. I now had her supported between two persons and moved about the hut at the same time douching her with cold water about the face and chest, pricking and pinching her about the arms and legs. I procured some cowhage and applied it to her arms and legs, with good effect, as she gave evidence of returning sensibility by requesting to be let alone, and made several attempts to scratch herself. She was however still unable to sit without support.

Some strong coffee without sugar or milk was made, and a tea cupful for a dose was administered, not without much difficulty, as she was very reluctant to drink such "bitter water" as she called it. However, with a great deal of coaxing and entreaty on the part of her mother, she was induced to take 4 cups during two hours. A period of 3 hours had elapsed since the cowhage was applied, and although she was obliged to be actively engaged in scratching herself during this period, yet there was some degree of narcotism present. At 5 in the evening, 6 hours after I had seen her, she was considerably better, and was able to sit up for a short time, but unable to stand without support. In consequence of the fatigue from being dragged about, I was induced to allow her to rest for a few minutes. At 6 P. M., I wrote to Dr. McGregor, the medical officer of the regiment, acquainting him of the case and the treatment adopted. Dr. McGregor recommended a turpentine enema being administered to rouse the patient from the state of drowsiness which still remained. From the great repugnance that natives in general have to enemata, I was prepared to meet with objections; however, after much persuasion, the enema was administered, and soon afterwards, I was glad to find that the drowsiness was quite overcome. At 8 P. M., she called for some conjee which she drank; from this period to 9 o'clock, I kept her engaged in conversation, when I left her for the night, and on visiting her next morning I found her doing well—complaining

chiefly of weakness, and as her bowels were not freely moved, I gave her a drachm of compound jalap powder.

Remarks.—In this case there was extreme narcotism, characterized by the contracted pupils and insensibility to light; limbs powerless; cold skin and perspiration, and loss of the power of deglutition. I certainly had very little hopes of her recovery when called to see her. On being told that she had taken opium, I took the precaution of taking the stomach pump, besides 2 emetic doses of sulphate of zinc with me; and although for the want of better means to rouse her, I was obliged to resort to pricking, pinching, and the application of cowhage, yet they answered very well, and in the absence of a very powerful auxiliary as galvanism, which cannot at all times be at command, they are not to be despised.

I take this opportunity of saying a word regarding the want of that invaluable instrument, the stomach pump, in the generality of native regimental hospitals in the service; what would have been the result of the case now under consideration were it not for this instrument? Nothing else could have saved the patient, and I think it absolutely necessary that every regiment, and large detachments, should be supplied with such an apparatus.

P. S.—As the treatment of cholera by quinine has lately been written about in the newspapers, and as I have during the last 3 years treated the disease with this medicine in combination with iron and sulphuric acid, I will prepare a paper for your journal shortly upon this subject.

PART SECOND.

Notes of Professor A. BLACKLOCK's Lectures on Medical Jurisprudence.

(Continued from page 161.)

MEDICAL EVIDENCE.

When you appear in a Court of Justice, as a medical witness in a Criminal case, you ought to bear in mind the following rules, in giving your evidence:

I. Never begin your reply to a question, till you clearly understand the meaning of the question.

II. Answer question after question in clear simple language, without professional technicalities or phrases in any other language than that in which the proceedings are conducted.

III. Never attempt to use notes to refresh your memory, unless you are prepared to swear they are original notes made at the time of the occurrence of which you are about to speak. You will not be allowed to use a copy of the original notes.

IV. Do not appear to be too self-confident or indifferent in your replies, and never state anything pertly. By so doing, you would give rise to impressions unfavourable to yourself and to your evidence. You might even be called to order by the Court, which would unnerve you to a certainty.

V. Give your own personal experience if possible. If you cannot strengthen or corroborate your opinion by giving your own experience there will be no objection to your giving that of others.

VI. A book authority will be received when quoted, because any single individual's experience is very limited.

VII. No hearsay evidence can be received, unless it has been a dying declaration under certain circumstances.

VIII. In giving accounts of what you have seen, take care not to make mistakes. But if you discover you have made a mistake in your evidence, lose not a moment in correcting your error before the Court.

IX. Take care not to differ widely from other medical witnesses, unless there are strong grounds for doing so. In fact, do not differ merely out of pure combativeness and merely for the pleasure of differing and showing your own opinions.

X. Remember that the Court can reject any parts, or even the whole of your evidence.

XI. Do not divulge any of the secrets of your patients, however humble, unless the Court really require you to do so.

We shall now take these Rules, one by, one and endeavour to show the necessity of attending to them.

I. *Never begin your reply to a question till you clearly understand the meaning of the question.* This appears to be one of the most important cautions which can be conveyed to you, as much confusion often originates in want of due attention to this unpretending rule. Even in this class-room you are well aware there is sometimes great difficulty in obtaining a correct reply to questions, simply because the pupils do

not always take care to assure themselves that they understand the purport of the questions, before proceeding to form their answers. If you do not thoroughly understand the language in which the question is conveyed, you should be all the more careful to ascertain the exact meaning, not only of the question as a whole, but also of each word of it, that you may effectually prevent the possibility of a mistake on your part. While you are under examination, you are quite at liberty to ask the person who is interrogating you to put the question in another form, or to word it differently; and the Court will not be impatient of the delay you may thus occasion, but will rather be well pleased to see you are desirous of giving certainty and precision to the information you have to communicate, by endeavouring to be first of all certain that you clearly understand the literal meaning of the questions themselves. As Professor A. T. Thomson has well observed, "no man can be in a more pitiable condition or be laid so open to suspicions as he whose testimony in open Court requires to be corrected or explained," and if you would escape the misery of a sorry exhibition of the kind you must make sure that you really understand what is addressed to you as a witness.

II. *Answer question after question in clear simple language, without professional technicalities or phrases in any other language than that in which the proceedings are conducted.* The great majority of questions on any subject require merely a distinct yes, or no, in answer to them, as "Was he breathing laboriously when you first saw him"? No. Had he lost much blood before you arrived? Yes! But a question may be put which may involve several points of enquiry as to facts and professional opinions, and you should be careful to give the various points of your reply, as nearly as possible in the order of the enquiries in the question.

Avoid technicalities as much as you psssibly can, consistently with precision of description or explanation. The Jury cannot be expected to understand Chemical and Anatomical terms, though it is well to remember that men *are* sometimes found in a Jury who *do* know fully as much as yourself in such matters, and any uncalled for employment of fine words would be ascribed at once by shrewd lookers on to your desire to display your own learning and your neighbour's ignorance. "Be the plainest men in the world (said Sir William Blizard, some years since, to his pupils) in a court of justice; never harbour a thought, that if you do not appear positive you must appear little and mean ever after; many old practitioners have erred in this respect.

Give your evidence in as concise, plain, and yet clear a manner as possible; be intelligent, candid, open, and just, never aiming at appearing unnecessarily scientific; state all the sources by which you have gained your information. If you can, make your evidence a self-evident truth; thus, though the court may at the time have too good, or too mean, an opinion of your judgment, yet they must deem you an honest man; never then be dogmatic, or set yourself up for judge and jury; take no side whatever, be impartial and you will be honest. A good many years ago, a man named Haggard was tried before the High Court of Justiciary in Edinburgh, for the murder of a jailor whom he had mortally injured, by striking him on the side of the head, with a large stone swung in the foot of a stocking. Two medical men were examined as witnesses to the nature and extent of the injury. The junior told a plain sensible story, to the effect that the bones, on the side of the jailor's head, had been broken and forcibly driven in upon the brain, so as to extinguish life by compression of that organ, but the senior, a fine old gentleman with a very bald head, went into all the particulars as to how the blow had been inflicted on the parietal bone; how that bone was forced in upon the cerebral substance so as to impair the sensorial functions; how the fissures radiating from the depressed central parts, traversed the sagittal, the temporal and lambdoidal satures, and how the middle meningeal artery had been torn across, &c. &c. &c. This extensive description was illustrated by the old gentleman bowing his bald head to the Jury, and tracing upon it with his finger the site and direction of the depression and radiations of which he was so learnedly discoursing. The jury had understood the description given by the junior, because any one could have understood it; but they began now to suspect his description was plain and simple only because he had no conception of the intricacies of the case as conveyed in the deeply professional language of the senior; and they were only extricated from their embarrassment by the Judge, I am sorry to say, explaining, while summing up, that the injuries, as explained so luminously by that very learned medical practitioner, had evidently been inflicted with a murderous intention. I speak of this case; from recollection; but some surprise was exhibited at the time, at the fact of a judge showing a marked preference for evidence delivered in a style calculated to mystify any jury as to the real nature of the case, while common sense made people discern intuitively, that the plainer explanation was really the more valuable.

But, in avoiding as much as possible the smallest use of professional

terms and phrases, do not fall into the opposite error, of departing from truth, by using a style of description which, from containing few words correctly applicable to subjects of the kind, can never be true to nature. When Mr. Raven, a Surgeon, was examined in the case of the Earl of Pembroke before the House of Peers, April 4th, 1678, for the murder of Mr. Cony, he perpetrated the following absurdities in his desire to be explanatory:

"*Mr. Raven* examined. I viewed the body, my Lord, before, and when it was opened, and it was reported to me that there was a bruise in each side of the belly; of which, thereupon, I took a stricter view, and could find no blackness nor blueness, nor marks of bruises; upon which the body was opened, and there issued thence clotted blood; then I looked upon the caul, which was withered and consumed, and the heart was as loose as a rag, and his lungs stuck to each side of his ribs; and as to the matter of the blood, that was not an extraordinary thing, for it is known to physicians, that *in all natural deaths there* must be *extravasated* blood in the lower belly."

Lord H. S. How did you think there came to be that quantity of blood there? This blood, I think, my Lord, must be extravasated by the violence of this gripes, for it is proved he drank a great quantity of claret, and afterwards of small-beer, which set the blood upon a fermentation, that set him a vomiting. By the violence thereby used to nature, this blood was thrown down into the belly; but in all natural deaths, if there be not so great a consumption of the blood, that there is none left, there must be some *extravasated;* it is a clear case."

Or, take the following from the case of Ann Barber, tried for the murder of her husband by poison, York assizes 1821, and we will see another instance, where the desire to be explanatory, or the want of well-chosen plain words and good descriptive powers, has led the witness to ascribe properties to arsenic of which it never was possessed:

"*Mr. J—H*—sworn.—I am a Surgeon and Apothecary at O—, about a mile from the place where the deceased lived. On Saturday, March 17, I was sent for to see the body: I went on Sunday morning, when the inquest was sitting, and opened the body: I was able very clearly to ascertain the cause of death: I found the stomach in a very putrid state; the coats were very much corroded: it was very much inflamed indeed: the death attributed to mineral poison: it is within my knowledge and experience that mineral poison would produce the effects I observed: from the coats of the stomach I took mineral poison: it was white arsenic: I proved it by a solution of ammoniated copper: the solution is purple: on putting arsenic it becomes quite *green*: nitrate of silver *does the same:* it is a very delicate test: I tried it by both, and found the same result: I know of no other substance but arsenic that does convert them into green: I am satisfied that it was arsenic: I opened the body further: the lungs were very black, which I look upon as a criterion of mineral poison: the external appearance I saw the

same in cases where it was known that arsenic was taken : on the body of the deceased there were various livid spots : the *skin of* [query over] *the stomach* was quite green, twice the breadth of a man's hand : I was satisfied from the appearance that he had died of mineral poison.

(" Cross-examined.) I never saw the body till Sunday morning, between eleven and twelve ; and he died on Saturday morning at four, I understood : the ears were black, the finger-ends were black : convulsions would make the body look black : appearances in so aggravated a state could not be produced but by mineral poison : matter issued from the mouth, which is another criterion : convulsion is produced by many causes quite distinct from mineral poison : I really cannot tell how many mineral poisons there are : *I never applied the test before and never saw any other person apply it :* the presence of arsenic may be detected by red-hot iron ; upon that a smell as of garlic or onions, arises : I did not try that test, I was sufficiently convinced without that : *this poison is a subject I am very little acquainted with* : the lungs could not have been so black in the circumstances, but by arsenic : I observed no other bruise : I did not open the head, there was no occasion."

While you avoid needless technicalities try, therefore, to avoid vulgarities which bear no true relation to the subject. Bring the understanding of the Jury up to your knowledge of the matter, but do not lower your knowledge to what you may erroneously consider their poor ideas.

III. *Never attempt to use notes to refresh your memory unless you are prepared to swear they are the original notes made at the time of the occurrence of which you are about to speak. You will not be allowed to use a copy of the original notes.* The strongest memory may be at fault occasionally when suddenly called upon for statements of dates, particulars in the appearance and treatment of a medical case, or minute results of chemical processes, and it is well therefore to be provided with notes taken at the time the events occurred or operations were in progress. But as I have already directed your attention to this subject, I shall now merely quote for you an extract from the case of Sir A. Gordon Kinlock, who was tried at Edinburgh, June 29th, 1795, on which occasion the objections to notes taken at some distance of time from the date of the occurrence were pretty well argued.

" *Lord Advocate* * * * If, in the course of examining any witness, he shall find himself at a loss, and desire to consult notes taken on the spot, and at the very time a transaction happened, I say it is competent for a witness to refresh his memory : but it is not so with notes taken at a distance of time ; they must be taken immediately, because it may be in the power of a witness, by means of such notes, to make up so connected a story, that I defy the counsel, on either side, to make out the fraud. I am far from saying that this witness has any such

design; * * * * * but, as public prosecutor, it is my duty to prevent the establishment of any bad precedent. * * * * I shall only add, that it was held on the trial of *Mr. Horne Tooke*, that notes taken at a distance of time could not be used by a witness. The point was long and ably contended by both sides of the bar, and at last, decided against the admission.

Lord Eskgrove. There are certain rules which we should never relax. If a man comes to this bar as a witness, he is to swear to what he now remembers, not to what he formerly remembered. * * * * A man who has been present at any interesting occasion, when he expects to be called upon as a witness, may take notes, and produce them in court; but this is very different indeed from a narrative taken at the distance of weeks. I am decidedly of opinion, that the witness is not entitled to use these notes.

Lord Swinton. A witness may use notes taken down at the time an affair happens, but not when taken down weeks afterwards. There would be no harm in the witness looking them over before he came in here, but to take them out here is against all rules.

"*Lord Dunsennan* agreed with these judges.

"*Lord Craig* thought the witness might have recourse to his notes when any particular question was put to him.

"*Lord Justice Clerk* * * That a witness is not allowed to take out a paper, read it over, and say 'there is my evidence,' this I allow; but it is admitted by your Lordships—it is admitted by the Lord Advocate—that a witness may make use of notes taken at the time the fact happened. Now, where is the difference, though they are taken *ex post facto*, if he is ready to swear that he took them down with a good recollection? I therefore think, that if the witness does not recollect any circumstance, he has a right to look at his notes before he answers the question: and then if he says upon the great oath which he has taken, that these are facts, they ought to be received in evidence; not, indeed, giving the notes as his deposition, but using them only for the purpose of refreshing his memory.

"*Mr. Hope.* Your Lordship must know that was all I asked.

"[The Court decided, by a majority, that the witness was not entitled to look at the notes. Recalled, and informed that he must not take them out.]"

IV. *Do not appear to be too self-confident or indifferent in your replies and never state any thing pertly. By so doing you would give use to impressions unfavourable to yourself and to your evidence—you might even be called to order by the Court, which would unnerve you to a certainty.* This rule is so explanatory in itself as to require no comment.

PART THIRD.

REMARKS BY THE EDITOR.

Although cholera has been a constant subject of study and investigation ever since its first outbreak in India in 1817-18, yet very little is known at the present day of the cause, nature, and treatment of this most formidable disease. Notwithstanding all the learned speculations that have been from time to time published regarding the causes of this disease, and the many prophylactic measures that medical talent and industry have suggested to put down its outbreaks, it still prevails with almost the same malignancy as ever. The rich, surrounded with every comfort, and living in commodious mansions at Adyar, or Guindy, and the poor, residing in ill-constructed houses, in crowded and imperfectly drained streets, become equally, to a greater or less extent, its victims. It spares neither the high nor the low; the learned, nor the unlearned; and seems to scorn the various attempts made, through civilization and physic, to confine it within certain limits. Under these circumstances, every endeavour made towards obtaining, if possible, some definite knowledge, either of the cause, or the treatment of this dreadful scourge must be looked upon by all with peculiar interest, particularly at the present time when cholera is prevailing to a considerable extent in Black Town, and other localities at Madras. At first it was our intention to give an abstract account of the researches lately entered upon by medical men in England, during the two last outbreaks of this disease in that country; but as Student Baker, the writer of the "Remarks on Cholera," which appear in this number of our Journal, will embody in his paper all that has been published upon this subject, we leave the task to him. We, however, cannot refrain from giving publicity to the following plan of treatment introduced by Dr. Stevens, and tried with decided success in England and elsewhere:

"On the first appearance of the premonitory symptoms a seidlitz powder was administered; but if the patient experienced a sense of sinking without diarrhœa, more active saline purgatives were then employed. The aperient generally used was sulphate of magnesia, from one to three drachms of which were added to the seidlitz, the whole taken in a state of effervescence. When this commenced acting on the bowels, the patient was encouraged to drink freely of thin beef-tea well seasoned with common salt. If vomiting was present, a sinapism was applied to the epigastrium: if the thirst was intense, seltzer, soda, or plain water, was allowed *ad libitum*. By the employment of these simple means, not more than one in twenty-five cases passed into the second stage—" "*Second stage, or that of developed cholera;* the diagnostic symptoms being cramps, coldness, or sinking prostration. The following powder, ℞ soda sesqui-carb, ℥j.; sodii chloridi ʒj; potassia chlorates, gr. vij. was dissolved in half a tumbler of water, and administered in severe cases every half hour, in some malignant cases every fifteen minutes; while in those cases which were not very severe, it was given every half hour. The frequency with which the dose was repeated in each particular case varied according to the circumstances of that case. In every instance the saline was continued until the circulation was fairly restored: when once that point was gained, the intervals between the doses were lengthened; and when reaction was completly established, it was left off by degrees. In extreme cases, the dose of the chloride of sodium was increased to two drachms, and in some cases to even more than this. In those cases where the stomach was very irritable, a dilute solution of chloride of sodium was thrown up into the intestines; the temperature of the saline enema being as high as the patient could easily bear, which, as a general rule, was about 100° Fah. When properly used this is a means of great value."

"When the stomach was irritable, the use of the saline powder was occasionally suspended, and common effervescing mixtures, or small doses of the common soda powders, with an excess of the carbonated, were frequently used, until the vomiting abated, and then the carbonate of soda, with larger doses of the chlorate of potash, were given without the chloride of sodium, or frequently, in such cases, the chlorate of potash was given by itself, in doses of ten grains each."

"A large mustard poultice was applied in such cases to the epigastric region the moment the patient came under treatment. When the saline powders were used at the time the stomach was very irritable, it was deemed advisable to dissolve them in a very small quantity of water. When cramps supervened, the extremities were rubbed with hot flannel. The pain produced by the spasms in the muscles was not only relieved by the frictions, but by this and the application of sinapisms to various parts of the body the temperature was increased: an object of no trifling importance in the treatment of cholera. In this stage of the disease as in the premonitory symptoms, seltzer or cold water was allowed the patients *ad libitum*, a strong infusion of green tea was also occasionally used in severe cases and apparently with advantage."

"The ejections and all other impurities were removed immediately from the patient's room—a pure atmosphere and great cleanliness being considered essentially necessary to a successful issue."

Dr. Stevens looks upon the administration of opium or other narcotics as fatal in cholera, and rests his entire confidence in the saline treatment alone which, in his hands and in that of others who have given it a fair trial, has proved eminently successful, the mortality being only 5 per cent in 1,000 cases. In support of their success, abundant evidence is brought forward by Dr. Bushnan in his work on "Cholera and its Cures," from which the above extract has been made. We would certainly recommend a fair trial being made of the efficacy of the above plan of treatment, and should it prove as successful in India as it is said to have been in England, we may congratulate ourselves in having a ready means of reducing the number of the victims of Cholera and of lessening the horrors of the disease itself.

In the saline treatment adopted by Dr. Stevens, we see only one new feature, viz. the use of chlorate of potass—the other two salts were used singly by two medical officers at this Presidency—the late Dr. Conwell treated cholera successfully by large doses of chloride of sodium, and Dr. Maxwell reports to have used, with equal success, carbonate of soda in effervescing draughts—the combined use of these two salts together with chlorate of potass, a salt containing a very large proportion of oxygen, is Dr. Stevens' plan—and the success may, in all probability, depend upon this simple circumstance.

We are fully aware that this mode of treating cholera, but without the chlorate of potass, has been repeatedly tried in India by several medical practitioners, and our reason for bringing it now prominently forward is not based upon its novelty, but that we believe it to be the most rational and the most successful of the numerous plans of treatment that have been recommended from time to time.

In "Wilson's Portraits of Diseases of the Skin" fasciculus V, an excellent illustration is given of the disease spoken of by Mr. O'Hara, in his paper which appears in this number of our

Journal. Mr. Wilson calls the disease Xeroderma ichthyoides and describes it as being characterized by " a general dryness and roughness of the skin, modified in appearance in different regions of the body—on a close examination of the skin, the pores of the follicles both sebiferous and capilliferous will be found to be prominent from the accumulation within them of a dry hardened substance, of which a portion often projects beyond the level of the apertures. This desicated substance is the epithelial lining of the follicle altered in its character by the absence of its oleaginous elements." This peculiar disease is said to depend on defective nutrition of the cutaneous tissue which is " sometimes thinner and sometimes thicker than natural—when soft it may be pinched up from the part beneath ; when hard it cannot be pinched up, but it may be moved backwards and forwards upon the subcutaneous fascia, as if there were no binding tissue between the under surface of the corium and the structure beneath." That the disease, described by Mr. Wilson, and illustrated in his excellent Portraits of skin diseases, is identical with that described by Mr. O'Hara, there cannot be the slightest doubt. The illustration closely resembles the cracked feet as seen amongst the Sepoys in India, and we are further strengthened in this view, by the opinion given us by an experienced medical officer at the Presidency. If we compare the etiology and pathology of the two diseases, we shall find no difference to exist between them. The Xeroderma ichthyoides, like our cracked feet, generally occurs amongst the most debilitated constitutions ; and the deep fissures noticed in the former disease when it occurs in the palms of the hand or soles of the feet, like the cracks in the feet, are due to the dryness of the thickened cuticle, which state is the result of morbid exudation of albuminous matter with a deficiency of that healthy oleaginous secretion necessary for maintaining the softness and pliancy of the skin. Impressed with this view of the disease, we are of opinion that the treatment adopted by Mr. Wilson, in the cure of Xeroderma ichthyoides may prove equally successful in cracked feet. The treatment consists of the internal use of cod-liver oil and

the arseniate of soda,* and the local application of vapour baths and frictions with warm lard, or white ointment, containing from five to thirty drops of croton oil to an ounce of ceratum cetacei. "By this plan," says Dr. Wilson, "where there were no complications dependent on peculiarity of constitution, anæmia or extreme debility requiring specific remedies, I have succeeded in curing many cases." We perfectly agree with Mr. O'Hara, that "prevention is better than cure," and that if the Infantry Sepoys were made to wear boots, instead of the sandals now in use, it would in a great measure prevent the disease, by keeping up a degree of moisture of the feet and excluding the dust and sand whilst marching. We would, however, give the preference to properly fitted shoes of the form known as "Oxonians" lacing in front and fitting close up to the ancles, and to be worn with woollen socks, which before being put on should have the inner surface well smeared with a lather of soap, or any lardaceous substance, this we are told will tend considerably towards keeping the feet moist and free from excoriations and corns.† There can be no objections to this system on the score of caste prejudices, as the Native Regiments which were in China have worn, and we believe do still wear, shoes and woollen socks, and we are informed that the use of this latter article has developed the industry of the families of the Sepoys, who have turned it to a profitable account by manufacturing socks for sale.

But, we are not disposed to believe that the immunity from the disease which the Cavalry Sepoy enjoys, is due altogether to his wearing boots on parades, &c.—other things must also be considered; the disease is not local but constitutional; hence arises the difficulty in the cure; the immunity may to a great

* Arseniate of potash—Fowler's solution—will do as well.

† We have been informed by those who have made pedestrian tours through the Highlands of Scotland, &c. that the best way of preserving the feet: from chafing during the prolonged walks taken at times over uneven ground, is by adopting the expedient recommended here. The shoes are made strong and well fitting, and the woollen socks worn are every morning smeared slightly where they come in contact with the foot, with soap. The foot is thus kept cool, inequalities in the socks are filled up, and the feet are found to escape abrasions and blisters.

extent be traced to the difference of habits and mode of living. The majority of Cavalry Sepoys consists of Mussulman who are proverbial for high living and dressing well. The pay of a Trooper is more than that of an Infantry Sepoy, consequently the former is better able to provide himself with good food and clothing than the latter—moreover, a Cavalry regiment is not moved about so frequently as an Infantry regiment, neither does it embark on foreign service—all these things, though they may appear trifling when taken singly, have collectively considerable influence over the constitution of an individual.

We congratulate our subordinate brethren of the service upon the publication of the Order, permitting Medical Apprentices and Medical Pupils to reckon their services from the date of their being passed at the Medical College, as qualified for Assistant Apothecaries and Second Dressers, respectively. This is as it ought to be. Services faithfully and efficiently rendered to the State should be duly credited to the individual, whatever may be his rank. This Order must be more especially gratifying to those who were employed in the China expedition as Apprentices and Pupils ; though qualified to act as Apothecaries and Second Dressers, yet were not so appointed. The contrary to this is invariably observed in the sister Presidencies, and here also in the Commissariat and Ordnance Departments of the service, when an individual is called upon to perform the duties of a higher grade, he is appointed to act in that grade, and to receive the emoluments attached to it. To Dr. Key, we believe, the thanks of the department are due for securing this desirable concession.

During the whole course of our long connexion with the Medical College, we do not remember to have witnessed an academic year so distinguished for the amount of zeal, energy, and exertion as was displayed both by the teachers and the taught, during the Session 1851-52, nor did we ever witness so interesting a termination as we did on the 27th

April last. The several examinations of the students commenced on the 1st, and ended on the 23rd April. Three stipendiary students, P. Mooneasawmy, C. Bauloo, and S. Jesudasen, candidates for the Diploma of Graduate of Medicine, having finished the course of study prescribed for Native Apothecaries, were put through their final examination before R. Davidson, Esq., Physician General, as Government Examiner, and T. Key, Esq., Superintending Surgeon, Presidency, and R. Cole, Esq., Garrison Surgeon, as Assessors. These students were examined in Anatomy, Physiology, Chemistry, Materia Medica, Surgery, Theory and Practice of Medicine, Midwifery and Medical Jurisprudence, by the respective Professors; the Government Examiner and Assessors naming the subjects upon which they were to be examined. These students were also made to dissect and demonstrate the principal regions of the body; to perform certain surgical operations, and to illustrate the several chemical processes they would adopt in detecting arsenic and other poisons. These examinations extended over a period of 7 days, commencing on the 1st and terminating on the 7th April, occuping generally five hours of a day, from 11 A. M. to 4 P. M. The ordeal these students were put through were both severe and searching, notwithstanding which, they acquitted themselves to the entire satisfaction of the Government Examiner and Assessors, and were passed as fully qualified to receive the Diploma of the College.

The final examination of the military students, who completed their prescribed course of study for Certificates of Qualification, commenced on the 13th April. The Committee of Examination was composed as follows: J. McKenna, Esq., M. D., Surgeon 50th Regt. N. I., as President, and C. D. Currie, Esq., M. D., Superintendent Government Dispensary, and H. F. C. Cleghorn, Esq, M. D., Surgeon 1st District, as Members—Nineteen apprentices and ten medical pupils went up for examination, and were examined in Anatomy, Physiology, Materia Medica, Chemistry, Surgery, Theory and Practice of Medicine, Midwifery and Medical Jurisprudence; with the exception of one apprentice and two medical pupils, all passed very creditably and received the Certificates of Qualification.

These results must be highly gratifying to the Professors of the College, more particularly when viewed in connexion with the high encomiums passed by the Examiners on the qualifications of the two classes of students, both as regards their theoretical and practical knowledge of the different subjects upon which they were examined.

The usual annual examinations of the whole of the students, before the Medical Board, commenced on the 14th, and terminated on the 23d April; these were divided into *oral* and *written*, and conducted in the following order:

14th April—4th or Senior class—Oral examination.

Subjects.

1st. *Anatomy and Physiology.* The chest and the organs therein contained with their functions.

2nd. *Medicine.* Fever-Thoracic and pulmonary complaints, including the cardiac diseases.

3rd. *Surgery*—The surgery of the upper extremity including the shoulder joint.

4th. *Midwifery*—Laborious and preternatural labours.

5th. *Chemistry.*—Oxygen, arsenic, iodine, mercury, their medicinal preparations, uses and doses.

15th April—4th Class—Written examination.

Questions.

1. Let me know what you have to say on the remote causes of disease in general, they have been divided into predisponent and exciting, and include those acting externally to the body, and those connected with the body itself—the knowledge of the subject is of paramount importance in the prevention of disease and the point I wish to be kept chiefly in view in your reply?

2. Let me know what you have to say on the subject of secretion generally, and on that of the kidney in particular?

3. Let me hear what you have to say on the subject of wounds, confining your observations chiefly to incised and gun-shot wounds, noticing particularly the means natural or otherwise of arresting hæmorrhage, the dressing of the wounds, and the best means of favouring adhesion and cicatrization.

16th April—2nd and 3rd Classes—Oral examination.

Subjects.

1st. *Medicine*—Fever generally and intermittent and remittent in particular—apoplexy—coup-de-soleil—dysentery.

2nd. *Surgery* of the inferior extremity—scalds, burns and ulcers.

3rd. *Midwifery*—Natural labor, management of the mother throughout until recovery, and of the infant during the first month.

17th April—3rd Class—Written examination.

Questions.

1. Let me know what you have to say on Tubercular phthisis?

2. Describe to me what you know of the subjects of anthrax or carbuncle and varix?

3. State to me what you know of the influence which light, climate, diet and exercise exert on the body?

4. Let me hear what you have to say on the subject of animal heat?

19th April—3rd, 2nd and 1st Classes—Oral examination.

Subjects.

3rd Class.

Anatomy—The brain and spinal cord, the ear—the surgical anatomy of the inguinal region and perineum.

Physiology—of respiration.

2nd Class.

Anatomy—The abdomen and its contents, the surgical anatomy of the neck.

Physiology—Of the functions of the liver.

1st Class.

Anatomy—Bones, ligaments and muscles of the pelvis and lower extremity.

21st April—2nd Class—Written examination.

Questions.

1. Let me hear what you have to say on the subject of nutrition?

2. Let me know what you have to say on the subject of Rickets?

3. Let me hear what you know of the general properties of metals, their affinity for oxygen and their relation to acids?

4. Give me the definition of emetics—name those most generally used in medicine from the vegetable and mineral kingdoms, the doses and peculiar properties of each?

22nd April—1st Class—Written examination.

Questions.

1. Give me a descriptive account of the muscles connected with the shoulder joint.

2. Let me hear what you have to say on the subject of chemical affinity and the circumstances which influence it?

3. Let me hear what you have to say on the functions of the nutritive organs in plants, their food and its sources?

23rd April—1st and 2nd Classes—Oral examination.

Subjects.

1*st Class.*

Botany—Structure and conservative organs of plants.

2*nd Class.*

Materia Medica and *Chemistry*—Iodine, sulphur, mercury—hydrocyanic acid—their preparations, uses and doses.

The subjects upon which the students were to be examined orally were given in writing to the respective Professors, by the Secretary to the Medical Board on each occasion, in the Theatre of the College, after the classes had assembled, so that neither the Professor, nor the Students, could have any previous knowledge of the subjects of examination. The questions for the written examinations were brought by the Secretary to the Medical Board, in a sealed envelope, and after the roll of the classes was called and each student supplied with writing materials, the questions were read out to them to copy—every precautionary measure being adopted to prevent the students from having any access to books, &c.—one of the Professors or Assistants being present in the class room until the whole of the written exercises was finished.

The vivâ você examinations were upon the whole very creditable, and the Medical Board were pleased to express their unqualified satisfaction at the progress made by the students generally.

The written exercises were handed over to the Committee of Final Examination for military students, for their Report. The exercises of the following students were considered most creditable, and as such merited special commendation:

4th, or Senior Class—*In Medicine*—R. Wilkins, best; and C. Georges,

highly creditable—*In Surgery.*—J. C. Watson, best, and J. P. Rielly, and J. Sausman, very creditable.

In Physiology—J. Howard, decidedly best.

3rd Class—*In Medicine*—W. Baker, best ; and J. Duckworth, highly creditable.

2nd Class—*In Chemistry*—S. Wells, best ;—*In Physiology* and *Materia Medica*—A. D'Roza, best.

1st, or Junior Class—*In Anatomy*—J. A. Hadden, best ; and J. P. Friddell, very creditable—*In Chemistry*—J. A. Hadden, and J. Martin, of equal merit ; and *in Botany*—R. Harvey, best.

The Committee also made mention in flattering terms of the ability, and extent of practical knowledge displayed in the written exercises of the students, particularly those of the two senior classes ; and made especial reference to W. Baker's paper as being a highly creditable production, containing information and power of reasoning, only to be acquired by great industry and observation ; they were further pleased to observe in the exercises a facility of English composition which they were not at all prepared to expect.

The reading of the Annual Report, the distribution of Prizes, and the granting of Certificates and Diplomas to the passed students, took place on the 27th April at 4 P. M., on which occasion the following gentlemen were present :

His Excellency Sir Henry Pottinger ; with his Staff, Major Young, and R. Woosnam, Esq.

Hon'ble J. F. Thomas, Esq., and Sir Henry Montgomery, Bart.

Colonels A. Tulloch, C. B., A. Clarke, F. Blundell, C. B., and C. A. Browne.

Majors T. Lavie, J. Maitland, G. Balfour, W. G. Woods, and F. Scott.

R. Davidson, Esq., Physician General, J. W. Sherman, Esq., Surgeon General, W. K. Hay, Esq., Inspector General of Hospitals.

Doctors J. McGregor, Acting Deputy Inspector General of H. M.'s Hospitals, A. Lorimer, Secretary Medical Board, J. McKenna, W. Liddell, A. Hunter, J. Urquahart, H. F. C Cleghorn, J. Carr, and E. G. Balfour.

T. Key, Esq., Superintending Surgeon, President of the Col-

lege Council, Professors W. Gilchrist, J. Shaw, J. E. Mayer, A. Blacklock and G. Smith.

Rev. Messrs. F. Lugard, Anderson, Jenkins, Rajahgopaul, Venkataramiah, Scudder, M. D., Etterajaloo, McFarlane, Hardy, and Winslow.

A. B Powell, Esq., Kerakoose, Esq., A. Bower, Esq., Armour, Esq., &c. &c. &c.

Professor G. Smith, M. D., as Secretary to the Council of the Medical College, commenced the proceedings by reading the Report of the Council, from which we were informed that 152 Students were brought under instruction at the commencement of the Session; and that 10 lapses had occurred during this period, reducing the number to 142. Of this number, 29 would be passed out as qualified for the grades of Native Surgeon, Assistant Apothecary and 2d Dresser respectively; and 5 others would be recommended for removal from the service, 4 for having failed to afford satisfactory evidence of progress, and 1 for having fallen under the displeasure of the Council from repeated acts of misconduct. The conduct of the Students, within the precincts of the College, was said to be regular, and the industry displayed by most of them praiseworthy; but, out of College, the behaviour of many was such as would induce the College Council, shortly to lay before Government certain plans for placing the students under military supervision. Certain alterations and additions to the buildings of the College were mentioned as being required to better accommodate the students in the practical-anatomy rooms and chemical laboratory. The necessity also for a reading room for the students was pointed out. It was stated that an addition of 282 preparations had been made to the collection in the museum, during the year, making in all a total of 852 specimens. Allusion was made to certain changes recommended by the College Council in the constitution of the native branch of the subordinate medical department, which changes it was said, if carried into effect, would secure a better order of native subordinates for the service than it at present receives. Other subjects connected with the Professors' Reports of their respective classes, lectures, &c. were reported upon in detail, and which would take up too much of

our space to particularize. At the conclusion, the following students received awards of prizes, from the hands of His Excellency:

1st, or Junior Class.

Apprentice *R. Harvey*—A prize for attainments in *Chemistry*, another for *Botany*, a third for *Anatomy*, and a fourth for *General Proficiency*—Medical Pupil *Mooneasawmy*—A prize for *Botany*, and a second for *Anatomy*.

2d Class.

Apprentice *S. Wells*—A prize for attainment in *Anatomy*, another for *Physiology* a third for *Materia Medica*, and a fourth for *General Proficiency*, in Anatomy, Physiology, and Materia Medica.

Apprentice *W. J. Lincoln*—A prize for attainment in *Surgery*.

Medical Pupil *E. Ailsworth*—A prize for attainments in *Anatomy*, a second in *Physiology*, a third in *Surgery*, a fourth in *Materia Medica*, a fifth in *Medicine*, and a sixth one for *General Proficiency* in Anatomy, Physiology, Surgery, Materia Medica, and Medicine.

3rd Class.

Stipendiary Student T. Mauselaumoney—A prize for attainments in *Surgery*, a second in *Midwifery*, a third in *Diseases of the Eye*, and a fourth for *General Proficiency* in Surgery, Midwifery, and Diseases of the Eye.

Medical Apprentice *F. Duckworth*—A prize for attainments in *Medicine*.

Medical Apprentice *W. Baker*—A prize for attainments in *Clinical Medicine*, and another for *Clinical Surgery*.

Medical Apprentice *J. Fitzpatrick*—A special prize for attainments in *Clinical Medicine*.

Medical Pupil *Cajah Fareed Odeen*—A prize for attainments in *Medicine* and another for *Diseases of the Eye*.

Medical Pupil *Nathamonee*—A prize for attainments in *Midwifery*.

4th, or Senior Class.

Medical Apprentice *C. Georges*—A prize for attainments in *Medicine*, a second one for *Medical Jurisprudence*, and a third for *General Proficiency* in Medicine, and Medical Jurisprudence.

The Johnstone medal for the year 1851, granted to C. Georges, at the close of last Session, with the understanding on his part, that he held it open to competition at the end of this Session, was permanently awarded to him, from having maintained his high position in his class.

To R. Wilkins, a young man of unexceptionable conduct, and superior ability, was awarded the Johnstone Medal for the year 1852.

The Government Medal was awarded to medical pupil E. Ailsworth, as being the first in all his classes. This medal is open to challenge, next session.

The following Medical Apprentices, and Medical Pupils, were then presented with "Certificates of Qualification."

Medical Apprentices—C. Georges, R. Wilkins, H. Hackett, J. Gray, J. Butler, P. Anderson, E. A. Etridge, J. Howard, J. Sausman, C. W. White, D. Karney, C. J. Ambrose, W. Thomas, C. Smith, J. Ringrow, C. Marrow, and T. J. Rielly.

Medical Pupils—Cajah Fareed Odeen, Nathamonee, T. Rasuntheram, V. Yeatherajooloo, M. Appavoo, A. F. Appavoo, C. B. Sashadree Naicker, and Jay Singh.

Honorary Certificates were presented to C. Georges, S. Jesudasen, R. Wilkins, and Cajah Fareed Odeen, as temporary assistants in the anatomical department of tuition.

R. Davidson, Esq., Physician General and Government Examiner, next addressed His Excellency Sir Henry Potttinger to the following effect:

Being aware, he said, of the grave responsibility attached to the office of Government Examiner—as the character of the College depended upon the manner in which the first candidates for its highest honors should pass—the Professors were to show with what success they executed an important part of the trust resposed in them—and the public to be secured against ill-informed and incompetent medical men acting under the official sanction of duly constituted authority. He was determined to ascertain by a fair, but a strict and searching examination, the amount of professional knowledge possessed by the candidates. In this undertaking he had received considerable and valuable assistance from his associates, Superintending Surgeon T. Key, and Garrison Surgeon R. Cole.

Three students of pure native descent and unblemished character presented themselves for examination: the details of the examination that these student were put through would be uninteresting, but he assured His Excellency that the ordeal was a

severe one and extended over a period of seven days, commencing generally at 11 A. M. and ending at 4. P. M.—and that he felt great pleasure in stating that all three students passed with credit to themselves and to the College in which they were educated. Upon these results he presumed he was fully entitled to claim for the students, the Professors and the College a position equal to that of Bombay and Bengal.

From the great interest he always took in medical education, joining with heart and hand in any scheme for promoting this object, and being ever solicitous for the welfare of the medical College, he had opportunities afforded him of observing the advantages that both the public and the public service derived from the system of tuition adopted in this College—the higher place which our medical subordinates now hold in general estimation,—the greater responsibility to which they have attained, —and the more perfect confidence which is being reposed in them, are consequences which have naturally followed the knowledge imparted to them by a liberal government. He was pleased also to observe that a strong spirit of emulation is manifesting itself throughout every grade of the Subordinate Medical Department, in proof of which he instanced the many well written essays received in competition for the Government Prize Medal, in all of which he was glad to find indications of zeal and industry in acquiring a practical knowledge of the medical profession by close observation in the field of disease. All this exertion he believed to be due to the encouragements lately held out by Government. However much at times punishment may be necessary, he thought the best way to incite a body of men to exertion and perseverance, was by creating a feeling of becoming pride, and raising them in their own estimation by small honorary rewards.

But this spirit of emulation, he said, was not confined only to the subordinate Medical Department: a few well merited acts of patronage lately bestowed, had done much in rousing the once dormant talents of the commissioned medical officers generally, and he was glad to have it to say that there were lecturers springing up in nearly every large up-country station; and he assured our Professors that, if they intended to maintain the superiority of their College, they must not slumber at their posts,

for there are medical men rising up on every side who will put them to their mettle.

He concluded by requesting T. Key, Esq., President of the Medical College Council, to introduce to His Excellency the three students to receive the Diploma of the College.

T. Key, Esq. President of the College Council now came forward and introduced P. Mooneasawmy, S. Jesudasen and C. Bauloo—and, in doing so, he stated that, as President of the College, he had closely watched the career of these three young men, and he was now able from his personal knowledge to speak of their character which he was proud to say was unexceptionable. During the whole period of five years he never knew of a fault having been found with any one of them either within the College or without its precincts; but, on the contrary, he found them to be patient, diligent and attentive, having but one great object in view, that of becoming well qualified medical men; and, how far they had achieved this, His Excellency had been already informed by the Government Examiner. He had therefore much pleasure in presenting them to His Excellency, to receive from his hands the highest honor that this College could confer, and which they so deservedly merited both from their qualifications and honorable conduct.

Prior to His Excellency the Governor presenting each Student with his diploma, the Secretary informed them that they would be required to subscribe to the following Sponsio Academica which he then read.

"SPONSIO ACADEMICA.

SUBSCRIBED BY GRADUATES OF THE MADRAS MEDICAL COLLEGE.

I hereby solemnly promise, that I will, as far as in me lies, faithfully, honestly, and carefully fulfil all the duties and responsibilities of the Medical profession,—that I will under all circumstances, and on all occasions, maintain its purity and reputation,—that I will never be seduced from the straight path of its honorable exercise, by making my knowledge subservient to unworthy ends,—and that I will neither practise myself, nor countenance in others, quackery and imposture in any of their forms.

I further solemnly recognize it as my sacred duty to be kind to all, —to the poor more especially,—to prosecute my calling in an unselfish and benevolent spirit, and to do my utmost to advance the knowledge and respectability of the profession, of which I am now a member.

I finally acknowledge the right and power possessed by this College

to withdraw from me this their Diploma, should my conduct hereafter be such as to bring discredit and disgrace upon the honorable profession of Medicine."

Professor A. Blacklock now delivered the graduation Address; but, as we are unable to detail all the points embraced by the Professor in his observations we shall give only a few, and must refer our readers to the Official Report of the proceedings which will be shortly publishd. Professor Blacklock pointed out the many advantages that the native community would derive by having amongst them properly educated medical men of pure native descent, and that the future conduct of these graduates would determine the change which the feelings of the natives would take as regards European Medical Science. Referring to the grant of the Diploma of the College to these Graduates, he said they had had a very high honor conferred on them, and that too in the presence of the most honorable in the Presidency. He looked upon this day's proceedings as one of extreme interest. The reward these young men now received was justly merited by their persevering industry, zeal and patient submission to all the discipline it was found necessary to put them through. But they must bear in mind that their labors did not end here. Other troubles of a more responsible and trying kind would meet them in their professional career, and at a time when they would be separated from all sources of professional assistance and sympathy; to meet such trials they ought to be fully prepared; they must be fortified to meet these singly and to remain stedfast in the principles and doctrines they have been taught at this College. To do this, they should continue to apply themselves to the study of their profession, observing and judging for themselves; and, unless this course be pursued, they may in all probability give way to heretical doctrines. If they desire to become acceptable in Society, and to be looked upon as men of information, they must devote a portion of their time to the study of general literature.* This he would urge upon them as another great mean of gaining the confidence of the

* We take the liberty of recommending to our brethren the consideration of this subject, as we have been informed by competent authority that our medical subordinates are not wanting in medical knowledge so much as in general literature.—Ed.

better educated classes of the people. The Professor now took several parts of the Sponsio as his texts and ably dilated upon them, particularly on the point of being kind to the poor and to practice their profession free of selfish motives. They were told that the sick poor had special claims on their benevolence as medical men, and that the fame and fortune of many Physicians had been in a great measure indirectly derived from their kindness to the poor. They were bound to afford relief to all requiring their professional aid whatever may be their caste, color, or creed, and brought forward instances from Scriptures in support of this assertion. He concluded by enlarging upon the necessity of being strictly moral, as upon this attribute the success of a medical man greatly depended.

His Excellency the Governor in presenting the Students with their Diplomas expressed the great pleasure it afforded him in being the medium of conferring the honorable distinction of Graduate of Medicine, a distinction which they had fairly earned, and which he trusted was only the first of many which would fall to their lot in pursuing a course of professional usefulness.

Adverting to the Annual Report, he said he felt perfectly satisfied of the account given of the progress of the Students, and that the proposals for additions to the building and other alterations would meet with his best consideration. As regards the conduct of the lads without the precincts of the College, he said such things were to be expected when so large a number of young men as 120 were brought together from different parts of the country, and without being under any immediate control—the offences however he was glad to find, were not of a grave nature but such as would be naturally expected in youth. He regretted the obstruction that existed in carrying out the instruction in practical anatomy, and said that Government would adopt every legitimate means in overcoming this difficulty. As Governor, he had always taken very great interest in the Medical College, and he again thanked the Professors for the manner in which they had discharged the responsible duties entrusted to them. He gave a few words of wholesome advice to the young men who received their Certificates of Qualification and who were now about to leave the College for the active duties of their Profession.

Referring to the Report of the Government Examiner, R. Davidson, Esq., he warmly thanked that gentleman for the very great interest he took in maintaining the efficiency of the Medical Department generally, and anything he recommended would meet with every consideration not only from himself but from Government.

PART FOURTH.

SELECTIONS.

LECTURES ON DIGESTION, RESPIRATION, AND SECRETION,
GIVEN AT THE ROYAL INSTITUTION,
TO THE MEMBERS AND TO THE PUPILS OF ST. GEORGE'S HOSPITAL.

By H. BENCE JONES, M. D., F. R. S.,
Physician to St. George's Hospital.

[Continued from page 225.]

In my last lecture, gentlemen, I brought before you the different classes of substances which can be extracted from flesh. I showed you that flesh always contained, 1st, water; 2ndly, ashes; 3rdly, non-albuminous organic matters, as fatty matter and a peculiar sugar; and, 4thly, the nitrogenous organic substances. In this last class I showed you that there was a fibrous matter, which has been called the fibrine of flesh; that there was albuminous matter, which was precipitable neither by heat nor by acid; but by heat and acid together, after cooling, a precipitate was produced; and I pointed out some substances which appeared to be the result of a change in the muscle, of which the most interesting was kreatin. I alluded also to an alkaline body, which could be formed from kreatin—kreatinine, a specimen of which is now before you, and can be viewed after the lecture. It is a substance which exists in the muscle, and as I shall have occasion to tell you, it exists also in urine, in which it was detected before it was found in muscle. It can be formed by acting upon kreatin by means of strong acids, by taking away two equivalents of water. This nitrogenous body is probably one of the first products of those changes which the muscle undergoes in the human body.

It is my intention to-day to take milk as my subject, and I do this because it is the universal food—a food which requires no cookery; and I shall endeavour to show you that in milk the mechanical and chemical laws which apply in the case of vegetable and animal food, are fulfilled to the greatest possible extent. I shall point out to you, first, regarding the chemical law, that every substance which exists in the human body exists also in milk, that the different elements, the proximate constituents of the milk, are closely allied to, in fact are identical with, those which exist in the body generally. I shall show you this certain fact, that in milk the four classes of substances exist which I have pointed out to you so frequently, namely, nitrogenous and non-nitrogenous organic substances, mineral matter, and also water. The nitrogenous matter has been called *casein*. It is closely related to the albuminous substance, and contains carbon, hydrogen, oxygen, nitrogen, sulphur. Casein C_{680} H_{269} N_{89} O_{220} S_7 P none.

The non-nitrogenous bodies are milk, sugar, and butter, and the ashes represent the mineral matters.

The proportions of these substances present in the milk, you observe are by no means constant.

In 1000 *parts of Human Milk.*

	Colostrum	4th day.	9th day.	12th day.
Casein	40·0	35·3	37·0	29·0
Milk-sugar ..	70·0	41·0	43·0	32·0
Butter	50·0	43·0	35·0	33·0
Ash.... ..	3·1	2·1	1·7	1·9
Sum of Solids...	172·0	120·0	114·0	94·0
Water.... ..	828·0	880·0	886·0	906·0

The table before you refers to milk taken from the same person at different periods, from the commencement of lactation. The milk taken at one time differs very considerably (that is, the quantities of the ingredients, not the actual qualities, differ considerably) from that taken at another period. The extent of the variations is represented by the following numbers:—

Human Milk.

	Maxima.	Minima.
Casein	45·2	19·6
Sugar	62·4	39·2
Butter	54·0	8·0
Ash	2·7	1·6
Sum of Solids	138·6	86·0
Water	861·4	914·0

You see how much the water in the milk, even in a state of health, may vary, forming occasionally as much as 914 parts out of 1000. And sometimes there is as little of the albuminous substance (casein) as 19½ parts out of 1000. The salts vary very considerably and so do the other constituents. But not only does the milk vary in the same person, but it varies according to the constitution of the individual. The

milk may be richer or poorer, according as the person is of a fair or dark complexion. This analysis has been lately made:

	Blonde		Brunette	
Casein	10·0 to	9·5	16·2 to	17·0
Sugar	58·5	64·0	71·2	70·0
Butter	35·5	40·5	54·8	56·3
Salts	4·0	4·5	4·5	4·5
Sum of Solids	108·0	118·5	146·7	147·0
Water	892·0	881·5	853·3	853·0

Moreover, it is also most certain that at no two moments of the day is the milk secreted precisely the same in composition. Not only does the state of the digestion and the substances eaten affect the composition of the milk, but states of the mind can produce an effect upon the milk. Sir Astley Cooper, in his work on the Anatomy of the Breast, p. 145, refers to cases in which mental emotions have produced most remarkable effects upon the constitution of milk; such, indeed, as to make this most nutritious substance a deadly poison.

We will now take each of the ingredients of milk separately, and examine their composition. I must first show you that these substances are present, and how you can obtain them.

First, as regards *water*. This is present to a considerable amount in milk, and can be evaporated by heat. (Various preparations of milk were exhibited, from which the water had been taken by different methods.) The quantity of water varies from 861 to 914 parts out of 1000. The specific gravity varies in the same proportion, being as low as 1018, and as high as 1045.

Secondly, there are *salts* present. If milk be simply burned, the ashes of milk are obtained. (Specimens exhibited.) The quantity of these ashes varies from 1·6 to 2·7 parts in 1000. These ashes contain certain inorganic constituents, as shown in this diagram:—

Inorganic Constituents of Milk in 1000 *Parts.*

Phosphate of	Lime	2·31	3·44
,,	Magnesia	0·42	0·64
,,	Iron	0·07	0·07
Chloride of	Potassium	1·44	1·83
,,	Sodium	0·24	0·34
Soda ..	... ...	0·42	0·45
		4·90	6·77

If you compare the ashes of milk with the ashes of blood or flesh, you will find that very nearly the same substances are present in the one as in the other, though in different proportions.

The most remarkable salt which exists in the milk (and it is most worthy of your attention) is *phosphate of lime*. No less than 3½ parts of phosphate of lime exist in 1000 parts of milk. This phosphate of lime is, without doubt, of the utmost importance to the growth of the young animal. Without it, the growth of the bones could not take place; for, as I have already mentioned, there is no phosphorus to be

found in the albuminous substance of milk. The whole supply of phosphorus, which forms so important an ingredient of the brain and the bones, must come from the phosphate of lime, magnesia, and iron, of which the ashes of the milk are chiefly composed.

In the third class of substances is *butter*, which is found in such large quantities in milk. This butter is not, as the name implies, by any means a simple body, but, on the contrary, a very compound body. It is very variable indeed in its composition. Bromeis, a German chemist, who has worked most on these fatty matters, has given the numbers before you, as representing the different fatty substances existing in butter.

In 100 parts of Butter.

Margarine	68
Oleine	30
Peculiar Fats....	2
	100

This is merely the general formula; the numbers vary in different, indeed in *all* specimens. This is merely given as a general view, as coming nearest to the truth. Of this substance, which is margarine, we have present 68 parts; of this, which is oleine, 30 parts; and 2 parts of peculiar fatty matter. You see here specimens of the volatile acids obtained from the peculiar fatty matters existing in butter. These volatile acids I must enlarge upon in my next lecture, for they form some of the most interesting substances which occur in the changes which take place in the different animal substances. They are represented in this diagram—

Volatile Acids of Butter.

$C_8 H_8 O_4$ Butyric Acid	$C_{14} H_{14} O_4$ Œnanthylic
$C_{10} H_{10} O_4$ Valerianic	$C_{16} H_{16} O_4$ Caprilic
$C_{12} H_{12} O_4$ Capronic	$C_{20} H_{20} O_4$ Caprinic.

with butyric acid, which closely resembles the valerianic acid. Butter contains margarine, which, when saponified, gives margaric acid; oleine, which furnishes oleic acid; and the peculiar fatty matter, when saponified, gives volatile acids. No less than six have been obtained and analysed; and these, as I shall show you, can be produced by submitting animal substances to different agents, which in my next lecture will be brought before you. In the air, the constituents of the butter easily become converted from the state of oleine and margarine into oleic and margaric acids. Still more readily do these volatile acids arise from butter. This change takes place when the butter begins to be rancid; and butter can be kept but a very short time without showing an acid reaction. A small quantity of casein, which remains adherent to the butter, acts on it as a ferment, and makes it undergo a rapid change, ending in that foul and peculiar smelling substance which you know as rancid, stinking butter. I shall much more closely examine each of these substances in the lecture on the changes which take place in the non-nitrogenous substances when they are submitted

to different agents out of the body. I refer to them now to show you that they exist in milk, and to prepare you for a future lecture.

It is said that the mode in which the milking has been made has a remarkable effect upon the quantity of butter in different portions of the milk. This is a matter of considerable interest to those who have to make determinations of the quantity of butter existing in different specimens of milk. It has been found, that if the milking takes place in divided portions,—if it is taken, for instance, in a number of glasses, while the whole of the milk would contain $4\frac{1}{2}$ per cent. of butter, the last portion taken off, say the sixth, the eighth, or the tenth glass, would contain $7\frac{1}{2}$ parts of butter; the one being drawn within perhaps a very few minutes only of the other. Thus the last portion would be nearly twice as rich in butter as the first portion. It was thought, in the case of the cow and the donkey, that the rising of the cream might account for this; the milk being always drawn off from the lowest part the cream would rise to the highest part and be drawn last, and thus that portion would, of course, be richest; but it is found that, when this same fractional milking is carried on in the human subject, the same result is obtained. This is a fact very lately observed, and as yet no satisfactory explanation can be given of it. In the human subject the mechanical rise of the cream is evidently not the cause, and such an explanation will not there apply. This is an interesting fact, for which we are indebted to M. Reiset; and hence if you have to analyse only the first portion of any milking you may find it poor, whilst if you finish the milking you may find it as rich in butter as you could expect. It has been found that the quantity of fatty substances taken in the food has a remarkable effect upon the quantity of butter. For this we are indebted to Dr. Playfair. He finds especially that, when vegetable food is taken, (which contains much fatty matter, as I have shown you,) the milk is richer than when food which contains but little fatty matter is taken. M. Boussingault, one of the first French chemists, has not fully confirmed Dr. Playfair's conclusions. M. Dumas, however, has found, in the case of dogs, that on vegetable food their milk yields more butter than when they are fed on animal food only.

Precisely the same thing is found as regards the *sugar of milk*, which is the next constituent I shall mention, and which is found in larger quantities in the milk of dogs, for instance, when they feed on vegetable than on animal food. Yet living on animal food does not entirely prevent sugar of milk appearing in the milk. This was established in Professor Scheerer's laboratory, in 1845, and since then in Professor Liebig's. To this fact I shall have occasion to recur in my lecture on Diabetes; it is of very considerable interest in the theory of that disease, that sugar of milk should be formed when an animal is kept upon meat only. When no vegetable substance whatever has been given to the animal for months, sugar of milk always can be found in milk. Sugar of milk differs from the other sugars, in the quantity of water it contains; and it differs in the changes it undergoes when acted upon by various agents. It does not give the same acids that other

sugars give. It gives lactic acid, and the very peculiar acid—mucic acid, or saccho-lactic acid, as it has also been called, and ultimately it gives oxalic acid also. I have here some beautiful specimens of these acids and of their salts. That sugar of milk exists in milk is proved without difficulty. I have here some milk which has been boiled with sulphate of magnesia. The excess of magnesia has been precipitated by potash, and the clear fluid, on the addition of a little sulphate of copper and strong caustic potash, assumes a beautiful blue colour. By boiling this a few moments, a reduction of the oxide of copper takes place, and you may notice the formation of a beautiful red precipitate, which is Trommer's test for sugar. (Experiment.)

In the fourth class of substance is the *casein* of milk; it is perhaps the most characteristic principle. The sugar of milk is very characteristic, but casein is still more so. It forms the chief constituent of cheese. On analysis, casein closely approximates to the other albuminous or albuminoid substances. According to Dumas and to Bensch, after animal diet milk contains much more casein than after vegetable food. The casein is probably distinct from the envelope of the milk globules. The milk consists of a liquid, with certain white globules floating in it. The white matter is not fat alone, and it is not casein alone, as an easy experiment will show you. If I take this clear whey, and add acetic acid, which has the property of coagulating casein, milk casein is immediately precipitated. The fluid was perfectly free from milk-globules, but, as you see, it contained casein in solution. (Experiment.) The milk-globules consist of a highly nitrogenous organic substance, enclosing the fatty matter, while the casein is a body represented by the analysis to which I have referred you. Whether it be a simple body, or a mixture of two or even three organic substances, is not decided. Let me say a few words on the tests for casein, by which it can be determined and distinguished from albumen; for example, the simplest test is acetic acid. But I shall have occasion to show, in a future lecture, that if albumen be boiled with alkali, and made, if I may so speak, into an albuminate of potash or soda, the albumen will not be precipitated by heat until acetic acid is added. Boiled alkaline solutions of albumen have the same re-action as milk with acetic acid. Milk is prevented from coagulating by heat, (you well know it only forms a scum when heated,) and this is caused by the conjunction of the alkali of the milk with the casein. The moment I add acetic acid to the milk, the casein is separated from the alkali which held it in solution. The same action occurs with albumen, if treated with alkali; therefore I cannot give you this as being the surest test for casein. A test which is liable to no fallacy or uncertainty is the action of rennet on fluids containing casein. The mucous membrane of the inner stomach of the calf is washed and dried, as you see here. If I take one part of the membrane and place it in eighteen hundred parts of skimmed milk, and gradually heat it to a temperature of 122°, or thereabouts, complete coagulation ensues; or, if I make an infusion of the stomach, and mix it with the milk, after the infusion has been left standing a short time, the separation takes place, as you see here. (Experiment.) This action of the membrane

of the stomach of the calf is the most characteristic test for casein. It is said that this membrane sets up a change in the milk-sugar, and causes it to be converted into lactic acid, which separates the casein; but in opposition to this theory, this fact is given, that milk that is alkaline and remains alkaline, and does not become acid, can be coagulated by rennet. As yet, the full explanation of this action is not known to us. A change of milk-sugar into lactic acid constantly takes place, but this is not the whole explanation; something further is wanting.

Such, then, is the chemical composition of milk. The comparison of human milk with that of animals is for a moment worthy your attention. Human milk is found to be more alkaline, and less easily becomes acid. It is also more sweet; it contains more oleine in the butter; it contains casein which is less perfectly coagulable by rennet, and the coagulum is not so hard and firm as the coagulum of cow's milk. The milk of the cow contains much more salts, less sugar, more butter, and more casein than human milk, whilst ass's milk becomes more easily acid, contains more sugar, much less water, and much less casein. The cause of many of these differences is probably the presence of a greater proportion of alkali in human milk than in that of other animals. The differences in the coagulation by acid no doubt have great effect on the digestion of the milk, because the fulfilment of mechanical law, requiring a fine state of division, is influenced by the degree of the coagulability of the milk. Human milk is not nearly so coagulable as other milk; it contains more alkali, and is not so easily precipitable by acids. In many specimens, indeed, of human milk, on the addition of acetic acid, no coagulation whatever occurs until the milk is boiled; then the acid will precipitate the casein as it would in cow's milk or ass's milk.

We have seen that milk contains albuminous organic substances—substances closely related in composition to albumen. It possibly contains more than I have mentioned; for it is very probable that casein, which has been analyzed as a single body, may be a complex body. The numbers given in the diagram as the formula for casein are useful as long as you are not misled by them; the formula is doubtful, and is changing every year as investigation proceeds. The milk, then, has one, or two, or more albuminous substances; it has also at least two non-nitrogenous organic substances,—milk-sugar and fatty matter; it has the salts which can be converted into ashes, containing nearly the same elements that exist in flesh; and lastly, it contains water. Thus much, then, for the fulfilment of the law, that all the substances present in the food are present in the animal. The substances in the milk are closely related to, and almost identical with, the substances existing in the animal, with the substances existing in the flesh, and with those in the wheat, of which I spoke in my first lecture.

I now come to the mechanical law. How is this satisfied? The constituents of the milk exist, capable of the finest state of division. Every ingredient, except the milk globules, is in solution. That these milk globules do not consist simply of fatty matter, I may now perhaps show you by the following experiments. If we treat milk with ether it will not become clear; the ether, you see, will take up but very little

butter. Of course there is a dilution to the extent to which ether is added, but no clearness is produced, no distinct action upon the fatty constituent of the milk, even if agitated for a long time, unless, indeed, you agitate it so strongly as to break the envelopes mechanically, which is done in churning. Unless you thus agitate, so as to rupture mechanically the envelopes, you get no solution of the butter ; there is something present which hinders the butter being acted upon by ether in the way that churned butter would be dissolved. This enveloping matter, I have told you, is an albuminoid substance ; therefore we know it will be acted upon by caustic potash. (Experiment.) I will use solid potash instead of liquor potassæ, which would render the experiment a litile less conclusive, by introducing another agent, namely, water, which might perhaps be supposed to have some action. I take some milk, and shake it for a few moments with caustic potash ; this substance so acts upon the envelopes of the globules, that they will not shield the butter from being acted upon by ether. The ether is then added, and the liquid becomes nearly clear, in consequence of the fatty matter being dissolved. There will be some small residue left undissolved, which results from the action of the ether, and not from the caustic potash. In these two tubes, which show you the milk acted on by ether with and without caustic potash, the contrast is, as you see, most remarkable ; the one tube is transparent, whilst the other is as milky as before. If I leave the liquid standing for some time, a remarkable change takes place in the tube containing the alkali. A red fluid is produced ; this colour is the result of the action of the caustic potash upon the milk sugar. This is, in fact, one of the tests for sugar, and is known by the name of Moore's test. Having thus shown you the composition of the milk globules, we may return to their solution. I have said that every body in the milk exists in a state most fit for absorption except the globules. The milk globules alone are unfit to be taken at once into the human body. By the remarkable property of the mucous membrane of the stomach, which I have mentioned to you, the casein is coagulated, and the sugar of milk is changed into lactic acid, and by the acid the envelopes are ultimately dissolved. This is the process which takes place in the human stomach when milk is taken into it ; the milk-sugar is changed into lactic acid, the casein is coagulated, ultimately the milk globules and the casein are redissolved, and form a perfect solution, which can be taken up by the blood-vessels, &c. Whether any change of composition takes place in the casein and milk globules when they are redissolved is not determined, though it is highly probable that some slight change does occur. The formation of lactic acid from sugar was probably designed for some other purpose than the precipitation and re-solution of casein. One cannot see any reason why the casein which was in solution should be precipitated and dissolved again ; though there may be some reason, as yet unknown to us. It appears to me most probable, that the formation of lactic acid takes place in the stomach, for the purpose of dissolving the envelopes of the milk globules, these being the only substances that do not exist in solution. The effect of the solution of the envelopes of the milk globules is, of course, the liberation of the butter. If the envelopes

were not dissolved, it is probable the butter would remain incapable of solution. If lactic acid were not formed, the envelopes of the milk globules would not be dissolved, and the butter would not be set free. But we cannot have lactic acid in the stomach without the precipitation of casein: this is the necessary consequence of the formation of lactic acid. You may perhaps say, "What is the object to be gained by the fatty matter being surrounded by these envelopes?" It seems to me that the object attained is, the fulfilment most perfectly of the chemical law of digestion. By this means the most perfect intermixture of the different ingredients of the milk is effected. If no milk globules existed —if we had simply casein, butter, sugar, salts, and water, the butter would float on the surface; and, at one time, the young animal would get nothing but butter, and at another time it would get no butter at all. But, by the formation of milk globules, the butter is surrounded by an envelope, and it is thus prevented from rising to the surface; it remains so intimately intermixed with the milk, that not one drop of milk can be taken without containing a portion of butter. To dissolve this envelope, and to liberate this butter afterwards, lactic acid is formed. I see no other explanation (there may be others) of the state in which these milk globules exist.

Thus, then, whether I take milk, or flesh, or wheat, in each I find the same four classes of substances present. All the substances that exist in man are present in his food. To fulfil the mechanical law, the ingredients of the food of infants are most easily brought to a fine state of division by a chemical action alone. No mechanical action whatever, as far as we know, except the mere muscular motion of the stomach, is introduced to effect a solution of the food of infants. In the adult, the mechanical force of the teeth is added to render the chemical action on the denser food more easy. The teeth are given for the purpose of reducing the food to a fine state of division. In the food of infants, the solution is simply chemical—this is the action which takes place in the stomach. Milk has been called "the type of food." As regards its chemical composition, the chief difference between it and other alimentary substances is in the quantity of water which it contains; so that, chemically speaking, I do not consider milk by any means the peculiar type of food; it is not more so than flesh or wheat. But, as regards the mechanical law, milk is, indeed, the type of food, from its capability of being finely divided, and from its affording nourishment to the infant who possesses no teeth. For its mechanical properties, not for its chemical composition, milk is the only food intended for use until the teeth are enabled, by mechanical action, to assist in the subdivision of the flesh or the corn, which, as you have already seen, contain the same chemical substances as the milk.

I have thus brought before you the three chief substances employed as food,—milk, flesh, and wheat, or bread. I might have taken any other vegetable or animal food, potatoes or fish, rice or eggs, and I should have arrived at the same results. Before entering into the action of the different secretions of the human body upon these different kinds of food, I purpose, in my next lecture, taking the nitrogenous, and, in the following one, the non-nitrogenous organic substances, and show-

ing you what changes they can undergo out of the body by chemical action ; thus, and thus only, I believe, will you be enabled to understand what I shall have to say in future lectures as to the changes effected by the saliva, the pancreatic fluid, the bile, and the gastric juice upon the different substances of which our food consists. The next two lectures will, I fear, be by no means so interesting as those which have gone before, because they will consist of duller and, perhaps, more difficult chemical details ; and yet, unless I can make clear to you the changes which take place *out of* the body, you have not the slightest chance of understanding the changes which take place when the food is introduced *into* the stomach of man.—*Medical Times, April* 19. 1851.

(To be continued.)

ON THE PHYSICAL DIAGNOSIS OF DISEASES OF THE ABDOMEN.

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(Continued from page 232.)

Percussion—*Mode of percussion—Results of percussion in health—liver, spleen, kidneys, &c. Physical signs of disease derived from percussion—liver, spleen, kidneys, &c.—hydatic fremitus.*

The sound emitted on striking sharply any portion of the body varies with its physical condition, of which it thus comes to constitute a sign. Immediate percussion, though adapted sometimes to the exploration of the chest, cannot be employed over the laxer parietes of the abdomen, partly because the wall is not sufficiently tense to vibrate readily in this manner, and partly because the process itself would be productive of considerable pain. Mediate percussion can alone be used ; and the sound produced by striking upon the pleximeter will vary with the physical state of the organs and parts which lie beneath that spot on the parietes to which it is applied, and the readiness with which they admit of or damp the sonorous vibrations. But, in addition to the sound observed, the percussing fingers perceive variations of resistance or yielding which are calculated to impart valuable information.

Mode of percussion.—The most convenient pleximeter is the middle finger of the left hand smoothly applied by its palmar surface on the part to be percussed. It is convenient, because it is always ready for use, and because it is capable of accurate adaptation to any part of organs or tumours which palpation can discover at any depth in the abdomen. In some cases, percussion on the finger gives pain to the patient, while none is complained of when a pleximeter is employed. Perhaps the best is the ordinary thin plate of ivory ; but care should be taken not to apply it to the surface cold, since this is likely to occasion involuntary muscular contraction. The stroke is made, in most cases, with the tips of the three first fingers brought to a level, or with two,

or only one. It should be made sharply and quickly from the wrist; and, when the sense of resistance is to be tested, the fingers should be allowed to dwell longer on the pleximeter than when the sound alone is to be ascertained. Percussion may be strong or gentle; in the latter case, the stroke may be made by fillipping gently upon the back of a single finger, or upon the nail. By gentle percussion, a sound is elicited whose character will depend upon the condition of the wall, and of the parts immediately beneath it; whereas, when it is forcible, the deeper tissues will modify the result. By noting the variations of sound occasioned by varied strength of percussion, a rough idea may be formed of the thickness of solid organs where parts which lie beneath them are qualified to alter the note. The position of the patient may be the same as for palpation; and it is often necessary to vary it, in order to ascertain whether sound can be altered by favouring gravitation towards or away from the part percussed. The muscles of the abdomen must be relaxed, especially when the deeper structure are to be reached. The position of the observer of course must be guided by convenience; awkwardness alone has to be avoided.

Results of Percussion in Health.

The sounds which percussion elicits may be thus enumerated. 1. The sound may be what is called *dull*, its type being that produced over the mass of the liver. 2. *Resonant;* the vibrations being prolonged over a period of time varying with the freedom with which they are permitted by the parts below: the sound is termed *tympanitic* when the vibrations are very free, prolonged, and drum-like. The note elicited varies as to its height or depth in the musical scale. There is a difference in the quality also of the percussion resonance:—*a.* It is termed *amphoric* when it has a large tubular character, such as may be imitated by fillipping the cheeks after inflating them; *b*, where a metalic tinkling is added, it becomes the "*bruit humorique*" of Piorry, because it was at first supposed that it required for its production the conjoined presence of gas and liquid. It frequently arises in the abdomen where liquid and gas are in contact, or where they are merely separated by a layer of membrane: but it may also occur altogether independently of liquid, as is exemplified in its production on striking the hands closed so as to include a hollow space, upon the knee, the air being allowed to escape through a narrow chink between the fingers. The dull sounds are produced where the vibrations of the wall are interfered with by the contact of solid or liquid matter; and the resonant, where neither of these are present, and the vibrations can occur with freedom.

Percussion applied to the liver.—Percussion over the seat of the liver produces, on account of its solidity, a dull sound, continuous and uninterrupted, over a space corresponding with the extent of its contact with the wall of the abdomen. Gentle percussion will elicit it over the whole surface of contact; and, by fillipping gently upon the nail, its boundaries may be very accurately determined. The line of its upper boundary has been already described as passing horizontally backwards from the lower extremity of the sternum: it is even and unbroken. The dulness of the left lobe extends about an inch and a half or two

inches to the left of the median line: in females who have been much compressed by stays, it extends much further in this direction. Its downward extent varies considerably; over the right lobe it measures mostly about four inches, in some cases reaching the margin of the ribs in the vertical line of the nipple; at others, not extending so low. In the middle line its extent downwards varies from an inch and a half to three inches. Examined behind, the dulness on gentle percussion rises to about the eleventh intercostal space. The lower edge of the hepatic dulness is bounded by the resonance of the colon; the upper edge, by that of the lung; and the dulness of the left lobe, by the resonance of the stomach. In children, the extent of the *superficial* dulness, from the proportionately larger size of the organ, is greater than in adults. To determine the level to which the summit of its convexity rises, the percussion stroke must be strong. The pulmonary resonance noticed by gentle percussion above the superficial dulness of the liver will then be observed to be deadened; this effect lessening, and the pulmonary resonance becoming purer, till it is perfected at about the level of the fourth intercostal space in front. Posteriorly, the *deep* dulness of the organ rises as high as the 8th or 9th rib. The deep dulness in children does not extend to so high a level as in adults. On using moderately strong percussion from the centre of hepatic dulness towards its lower edge, it is found to shade off gradually into the resonance of the colon; this qualifying the hepatic sound till the clear sound of the hollow intestine is attained. An idea of the thickness of the liver, a little way above the lower margin, may be obtained by the force requisite to elicit a mixture of resonance. Strong percussion also elicits the resonance of the stomach over the left lobe wherever this organ lies beneath it. When the stomach is full, not only is the percussion-sound altered, but the dulness of the left edge of the liver extends to a less distance to the left than when it is empty. Inspiration lowers, in proportion to its fulness, the upward level of the hepatic dulness, both on deep and superficial percussion: the lower edge of the superficial dulness also descends a little. Accompanying the dulness, there is a sense of resistance perceived by the finger, most marked over the region of complete dulness, on deep percussion, and shading off towards the lower margin of the organ.

Percussion applied to the spleen.—The spleen is another solid organ which imparts a dull sound on percussion in its region, but not so dull a sound as the liver. This cannot, however, be easily circumscribed, unless the stomach be empty; since, from the position of the spleen in relation to it, the distension of that organ with food or gas very readily modifies the result of percussion, and may even altogether destroy its dulness. The upper boundary of the splenic dulness, when determined under favourable circumstances, reaches the level of the tenth rib posteriorly, but deep percussion must be used in order to reach it through the intervening portion of the left lung. All that lies below the margin of the left lung imparts dulness on superficial percussion, which becomes continuous below with that of the kidney; a little resonance and diminished sense of resistance sometimes intervening. The vertical extent is about 3½ inches. The lateral extent of the dulness is

anteriorly bounded by the resonance of the stomach. It commonly measures about three inches; but both this and the vertical measurement vary exceedingly, from the varying size of the organ.

Percussion applied to the kidneys.—The dulness imparted to the wall of the abdomen by these organs is to be sought posteriorly. Their upward extent of dulness cannot be accurately determined, in consequence of its being confounded with that of the liver and spleen, which lie here in front of them. The lower extremity, however, is more favourably situated; the dulness of the solid organ contrasting with the resonance of the intestine which is found between it and the crista ilii. The dulness of the right kidney descends a little lower than that of the left. Laterally, its outer boundary is again determinable by contrast with the intestinal resonance. The dulness both of these organs and of the spleen takes a somewhat lower position after a deep inspiration. Both also impart a sense of resistance to the percussing fingers, which lessens, and at last is replaced by elasticity as their boundaries are approached.

Percussion applied to the stomach.—The varying condition of this organ, which is sometimes empty, at other times more or less filled with gas and different proportions of solid and liquid food, must necessarily occasion variations in the extent and quality of its sounds, as elicited by percussion. When it is moderately filled with gas, the sound is hollow and ringing, or tympanitic, but not strongly so, and is accompanied by a sense of elasticity: it mostly extends upwards to the level of the xiphoid cartilage; and, on superficial percussion to the border of the left lobe of the liver, its extent downwards and to the left varies with its degree of distension. On strong percussion, it is perceptible through the dulness of the left lobe of the liver as far as the median line, and the pulmonary resonance has a stomachal quality for an inch or two above the superficial resonance of the stomach itself, especially when the organ is unusually inflated. When it contains but little gas and no food, the resonance on deep percussion over the left lobe of the liver is less marked. Food and drink extend the boundaries of the sounds, and give rise to dulness where they gravitate. This is the only accurate and indisputable method of determining its lowest margin.

Percussion applied to the colon.—This, as the percussion of the stomach, varies in its results with the condition of the canal. When containing gas, there is resonance proportional to the distension of the intestine, throughout its course: it is better marked and more like that of the stomach in the right iliac region over the cæcum than in the left, where fæces often accumulate, and produce a dull sound. This, however, disappears after defecation, but even then the resonance does not equal that over the corresponding part on the right side. On superficial percussion, the resonance rises as high as the lower margin of the liver, at which level it crosses the abdomen. On the left side its upward extent will depend much upon the size of the spleen, and the state of fulness of the stomach. A large injection thrown up with force will occasion dulness where it fills the canal; and the metallic tinkling ("bruit humorique"), where it comes into contact with gas. Percussion made over the sacrum gives a resonant or dull sound, according as the rectum is filled with gas or fæcal matters.

Percussion of the small intestines.—The resonance of the small intestines also varies in depth with the amount of their distension, but is mostly less deep-toned than of the colon. It extends from the colon above to the pubes below, and across the abdomen from the ascending to the descending colon. They are the most moveable of all the abdominal organs, and thus are capable of having the extent of their resonance affected by a variety of causes which alter their position and extent of contact with the abdominal parietes: they may even lie so completely in front of the colon and part of the liver as to obscure the physical indications of their presence. Over all the parts of the intestines there is a sense of elasticity imparted to the percussing fingers.

Physical Signs of Disease derived from Percussion.

1. *Liver.—a. Dulness altered in position* without alteration in extent. It may be raised to a higher level towards the chest by causes distending the abdomen below it, its upward extent attaining the level of the third or fourth rib in front. It may, on the other hand, be depressed by disease enlarging the contents of the thorax on the right side; such as pleurisy or emphysema. Either of these changes of position may occur as the result of tight-lacing in females. The depression of the liver can be detected by palpation, but the elevation of it above the natural position into the chest, by percussion alone. *b.* It may be *increased in extent.* This may occur in any or in all directions; it may be only downward or upwards, or, when there is enlargement of the left lobe, it may occur principally or solely in its lateral width. In some of these cases the *outline of its upper or lower boundary is less even* than in health. *c.* It may be *diminished in extent.* Where the lower margin of the liver is rounded, a fallacy may arise from a portion of intestine slipping up between it and the abdominal wall. This may be obviated by pressure of the pleximeter below the apparent lower limit of the dulness, so as to displace the intestine and allow of the hepatic dulness below it being arrived at. The same thing may occur, but more rarely, when the liver is perfectly healthy. *d.* The *limits of the dulness may be unaltered* by respiration or varied states of the stomach and bowels. *e.* The *difference of the results of deep and superficial percussion* towards the margins of the liver *may be less than in* the normal state, the conjoined resonance of the stomach or colon not being capable of being elicited at all over their accustomed situations, or only on using a more forcible stroke than is requisite in health. Accompanying this sign there is increased resistance to the percussion over the same parts. *f.* There may be *resonance* in place of dulness over the hepatic region. This may not be a sign of disease of the liver, but of gas between it and the abdominal wall: when it occurs as a sign of liver disease it is mostly limited in extent, not occupying the whole of the hepatic region. It may present the amphoric character, and even the metallic tinkling echo. It is possible, however, that the entire of the liver dulness may be displaced by resonance from changes in the physical state of the liver itself, a case having been recorded in which the entire organ contained air.

2. *Spleen.*—The determination of the limits of the dulness of the spleen in the normal state is so difficult, that it may well be believed that it is still more so in disease. The following signs, however, are noticeable in respect to it as well as to the liver :—*a.* The dulness may be *altered in position*, the organ being thrown by pressure completely out of its natural situation. When the pressure is exerted from above, —as in pleurisy or pneumothorax—the dulness is observed lower than usual; and when from below, it is observed at a higher level on the side of the thorax. The position and extent of its dulness is greatly modified in tight-laced females, the dulness occupying a more anterior position. *b.* It may be *increased in extent.* This is very readily determined : the increase is mostly manifested downwards and to the right. It occurs sometimes to a very remarkable extent, and sometimes undergoes changes within brief periods of time. *c.* It may be *diminished in extent.* This sign is the most difficult to ascertain. The stomach and bowels should be empty when the examination is made, and the patient should be examined in several positions and at various periods of the day before it should be pronounced upon with certainty. It may arise not only from a diminished size of the organ, but also from gaseous distension of the stomach and bowels, or from one extremity of the organ only coming in contact with the wall in consequence of displacement from the presence of stays.

3. *Kidneys.*—*a.* The dulness may be *altered in position* from alteration in the position of the organ, either by pressure arising in disease of other organs or in the abuse of stays. When the organ is pushed downwards there is no resonant interval between its dulness and the crista ilii. Clinically, I do not know how this is to be distinguished from dulness arising from increased size of the organ, especially where the spleen and liver are hypertrophied and their dulness extends unusually downwards. When the kidney is displaced forwards or upwards, palpation discovers it better than percussion. In the case of a female, I once found the left kidney forming a palpable tumour on that side beneath the margin of the cartilage of the last ribs, and the dulness it gave on percussion extending about two inches above them. *b. Increased extent* of dulness is noticed in the directions downwards and outwards ; it may occur upwards also, reaching to a considerable height on the wall of the thorax, sometimes as high as the sixth rib. In cases where the spleen or liver are greatly enlarged, there is an actual impossibility of determining anything by percussion in the lumbar region beyond the presence of these solid organs, from whose dulness that of the kidney is not distinguishable. *c. Diminished extent of dulness* must be to a very considerable degree before it can be clinically appreciated.

4. *Stomach.*—The resonant note of the stomach may be variously affected in its position, extent, and quality. *a.* Its *position may be altered.* In determining this point,—as all others in connection with this organ,—it is important to be satisfied that the resonance whose characters are being examined is really that of the stomach, because a distended or displaced colon will often simulate its note. This can often only be effected by causing the patient to drink a quantity of water, or by making the examination when the stomach contains a

recent meal, as well as when it is empty. Where a dulness is suspected to be gravitative dulness of matter in the stomach, and the position of it on the wall of the abdomen, renders it capable of being mistaken for dulness from other causes, the patient should be made to vomit, or the occasion of spontaneous vomiting should be seized to aid in the determination of the point. It would in this case be succeeded by a resonance. The position of the resonance may be altered by causes acting on it from above or from below, or by changes in position and enlargements of other organs of the abdomen. It may thus be placed higher up in the thorax, than in the normal state; or it may be found lower altogether towards the abdomen, its resonance not rising so high as the natural level, or not being discoverable at all over the lower ribs; or it may be pushed so far to the right as that, even in the distended state, its resonance will not reach within a considerable distance its natural left limit. In some cases the resonance of the stomach assumes a more or less vertical direction, being traceable from the upper extremity downwards towards the umbilicus, its transverse diameter being proportionally lessened. This is a sign of that form of displacement of the organ which often occurs in enlargement of the liver, or depression of the whole organ and elongation of it downwards by the pressure of stays. *b. Increased extent* of stomach resonance may be so great as even to arrive at the lowest part of the soft wall of the abdomen, and the dulness arising from contained matters may be observed here also. On the other hand, it may rise to a considerable height into the chest. In these last cases there is the greatest difficulty in ascertaining accurately its upward extent, in consequence of the pulmonary sound, even on very gentle percussion, being tinged to a considerable distance with the tympanitic resonance of the stomach. It often becomes impossible also in this case to discover any splenic dulness, or even that of the left lobe of the liver. *c. Diminished extent.* This is normal when the stomach contains little gas or food, and to be pathological, it should be noticed under all conditions, and should have a character of greater or less permanence. *d.* The *character of the resonance* may be *altered,* and it may become unnaturally tympanitic, as is commonly the case when its extent is increased. The conjoined presence of liquid and gaseous matter also will develope the "humoric sound." The permanence of this sound, as also that of the gravitative dulness, should in certain cases be observed. *e. Dulness* is sometimes observed to replace resonance in situations where gravitation has no influence, and to be noticeable in all conditions of the organ: it is commonly found towards the pyloric extremity. Here, however, a thickened and enlarged left lobe of the liver may occasion a source of fallacy; but this may be overcome by observing that deep percussion elicits the stomach resonance, which would not be the case were the dulness due to altered physical condition of the organ itself. The position and characters of the dulness with deep or superficial percussion in different states of the stomach must often be ascertained.

5. *Colon.—a.* The resonance may be *altered in position.* This most frequently arises in that part of the colon which is naturally the most moveable, the transverse part of the arch; the least frequently dis-

placed parts being the cæcum, and the ascending and descending portions. The resonance of the transverse portion of the arch and of the flexures on either side may be raised by pressure from below considerably higher than natural, and a portion of it may obscure the dulness of the lower margin of the liver, or that of the spleen. In other cases the resonance of the same part may be noticed as low as the pubes. In any case where doubt arises as to the resonance being due to the colon, or to some other part of the digestive canal, a full injection of warm water will, by replacing it with dulness, determine the difficulty. It sometimes happens that the transverse colon forms an arch, with its convexity downwards and in contact with the wall of the abdomen above the pubes, the thinned mesocolon stretching over the small intestines between it and the liver. In this case, resonance above the pubes is not easily distinguishable from that of the small intestines without the use of an injection. *b. Increased extent* of the resonance from expansion and elongation of the canal may be observed sometimes to an extent scarcely credible, the whole of the abdomen, or nearly all, presenting the same deep toned resonance. *c. Diminished extent*: for this sign to be patholigical it must possess more or less of the character of permanence. It may be observed throughout the whole course of the colon, or only in a certain part of it; in the latter case, another portion may present an extended resonance. *d. Altered character* of the percussion resonance may be conjoined with the two last signs, as well as occurring independently of them. The sound may become more tympanitic than in health, or less deep-toned, or the "humoric sound" may be elicited. This is not in the intestine always the result of the conjoined presence of liquid and gas. *e. Limitation of the dulness from injection* has been used as an indication of a physical obstruction to its passage along the canal, at that spot at which it ceases to traverse it. *f. Dulness* may replace resonance in any part of the course of it, either entirely or partially: in estimating its value as a sign of disease in the colon, beside the adoption of other means of examination, its permanence or disappearance with alterations of position, and with defæcation, require to be observed.

6. *Small intestines.—a.* Their resonance may, like that of the stomach and colon, be *altered in position*: should doubt arise respecting its really belonging to this part of the canal, it may be set at rest by the discovery that it is unaltered by the imbibition of liquids into the stomach, or by injection into the rectum. The greater part of the small intestines is exceedingly moveable, and they may become disposed of in any part of the abdomen, when tumours of various kinds make demand upon its space: wherever they are placed, the corresponding part of the wall will present their resonance on percussion. *b. Increased extent* of resonance.—This may vary from very trifling increase of the surface over which the intestinal resonance is audible, to one which encroaches upon the position of those organs of the abdomen which have been enumerated above. *c. Diminished extent* of resonance occurs mostly with encroachments made upon the space they occupy by surrounding organs. *d. Altered character* of sound: it may become deeper-toned and tympanitic on the one hand, or a higher pitch than natural on the other; or it may, under certain circumstances, both when liquid is

conjoined and when it is not, present the "humoric" character. These varied characters in the sound are not observed universally over the surface of intestinal resonance, even the tympanitic sound being unequally distributed over it. *e. Dulness.*—This is rarely observed to any extent, unless other parts than the intestinal tube are affected. Still the resonance may in certain parts be more or less replaced by dulness over a limited space from disease of the tube itself. Limited dulness may arise also over the surface corresponding with this intestine, from disease of parts with which it is in close anatomical relation.

7. In addition to the physical signs above described, which may be referred with some accuracy to physical changes in the organs enumerated, *resonance and dulness, limited or extensively diffused, occur, which cannot be referred to them.* One reason of this is, that the space between the two layers of the peritoneum, commonly termed the "peritoneal cavity," may become the seat of accumulations of a gaseous or liquid character, either loosely effused or circumscribed by adhesions or by cysts. Wherever they accumulate, they push aside the organs which are naturally in contact with the wall, and present their own percussion sound in place of that which they have displaced. Another is, that certain parts which in a state of health do not come into contact with the wall, and thus give no physical sign by percussion of their existence, do both when diseased. I may instance in this respect the pancreas, the several folds of the peritoneum and the lymphatic glands, or other vessels of the abdomen. A third reason is, that certain organs which in health occupy the pelvis, as the bladder, uterus, and ovaries, rise out of it in disease, and displacing upwards and latterly the true abdominal organs, occupy the space of their natural resonance with their own variety of sound. Whatever the modification of percussion sound may be, it should be carefully determined, its limits and outline accurately drawn, its alterations with changed position of the patient ascertained, and its variation with the lapse of time, and with varied conditions of the abdominal organs, closely and patiently observed. Where this is done, and a proper method adopted in exploration, it is remarkable with what precision the physical condition of internal organs and parts may be determined.

8. Percussion affords signs of abdominal disease, by disclosing certain *physical conditions of the thoracic organs* which may result from its presence. As respects the *pulmonary resonance*, allusion has already been made to the infringement upon its lower limit by the enlargement of organs in the abdomen, or by effusions and accumulations within its cavity: but in addition to this it may be rendered dull by accidential communication between the pleura or the lung and morbid cavities in the abdominal organs, and the effusion of their contents into either. The *heart's dullness* may in like manner be displaced. This is, however, chiefly in the direction upwards, not laterally as in pleurisy of the right side. It may be increased also by rupture of morbid cavities, and effusion of their contents into the pericardium. It is probable that it may sometimes be lessened in extent by being pushed beneath the margin of the left lung.

9. Along with changes in dulness and resonance, percussion indicates in all the instances mentioned corresponding *changes in resistance and elasticity*. Another sensation perceived in the act of percussion is that which occurs in certain cases when hydatids have accumulated in any part sufficiently near the suface of the abdomen. It is called the "*hydatic fremitus*," and has been compared to the sensation perceived by the finger on striking a mass of jelly, or on percussing on the glass of a repeater watch placed upon its back on the left left hand. In order to its development, however, the cysts must be in a definite condition; they must be in contact with just enough liquid between them to fill up the intervals, an excess or deficiency of this impairing the perfection of the fremitus, or at last altogether destroying it. This very much diminishes the clinical value of the sign.—*Medical Gazette, August* 15, 1851.

(To be continued.)

PHYSIOLOGY.

Capacity of the Crania in different Races of Man.—Dr. Morton, author of the great work on *Crania Americana* (whose death we regret to have seen recently announced), has given the results of the internal measurements of 623 human crania. His process for admeasurement was to fill each cranium with leaden shot, and determine its absolute capacity, or the bulk of the brain, in cubic inches; the following are some of the facts elicited:

"1. The Teutonic or German race, embracing the Anglo-Saxons, Anglo-Irish, Anglo-Americans, &c., possesses the largest brain of any people. 2. The nations having the smallest heads are the ancient Peruvians and the Australians. 3. The barbarous tribes of America possess a much larger brain than the demi-civilised Peruvians or Mexicans. 4. The ancient Egyptians, whose civilisation antedates that of all other people, have the least-sized brain of any Caucasian nation, except the Hindoos, for the very few Semitic heads will hardly permit them to be admitted into the comparison. 5. The Negro brain is 9 cubic inches less than the Teutonic, and 3 cubic inches larger than the ancient Egyptian. 6. The largest brain in the series is that of a Dutch gentleman, and gives 114 cubic inches; the smallest head is an old Peruvian, of 58 cubic inches; and the difference between these two extremes is no less than 56 cubic inches. 7. The brain of the Australian and Hottentot falls far below that of the Negro, and measures precisely the same as the ancient Peruvian. 8. This extended series of measurements fully confirms the fact stated in the 'Crania Americana,' that the various modes of distorting the cranium occasion no diminution of its internal capacity, and consequently do not affect the size of the brain." (p. 57.)

ANATOMY.

Report on Medical Science and Practice.—The first article under this head refers to some investigations of Professor Wyman on the

Arrangement of Cancelli in Bone. The cancelli, he states, of bones which assist in supporting the weight of the body, are arranged either in the direction of that weight, or so as to support and brace the cancelli so placed; so that they may be regarded as acting in nearly all these bones as a series of "studs" and "braces." These fibres of some of the bones in the human subject have a definite direction in relation to the erect posture. In the *lumbar vertebræ* some are disposed vertically for the purpose of directly sustaining the weight of the body, and others brace these at right angles. The *cervix femoris* is supplied with two sets of cancelli:

"One set rests or abuts on the convex surface of the thick shell which forms the under wall of the neck, and from this they diverge towards the upper portion of the head, neck, trochanter major, and portion of the shaft just below this last; those which extend into the head are much the longest. The fibres of the second series are arranged in parallel curves, the extremes of which are attached on the one hand to the wall of the bone at the base of the great trochanter, and on the other to that portion of the preceding class of fibres which supports the upper surface of the head, as well as to the shell of bone between it and the trochanter. Both of these series are braced by other fibres, which are arranged at right angles to their direction. The cancelli of the great trochanter have no determinate form. The internal fibres thus act as braces, assisting the outer walls to support the weight of the body; the curved fibres resisting by their tenacity, the straight or radiating ones by their rigidity. The long straight fibres transmit weight directly to the under side of the neck, and are themselves supported by the curved fibres, and these in turn by the radiating fibres." (p. 55.)

In the lower part of the femur and the tibia, the cancelli are adapted to support vertical pressure. On the astragalus the pressure is vertical; but as the bone rests itself upon the os calcis below and the scaphoid in front, there exist two series of cancelli, directing pressure on the surfaces of support. In the os calcis, too, there are two intersecting sets of fibres, the one radiating, the other in concentric curves.

These arrangements are not found in quadrupeds, and only traces of them exist in apes, while in man himself they are chiefly confined to the bones engaged in locomotion. In these a certain direction of fibres coincides with a certain direction or certain directions of the transmission of pressure.

PRACTICE OF MEDICINE.

"1. That one single and perfect vaccination does not, for all time, in all cases, deprive the system of its susceptibility of variolous disease. 2. That one or more revaccinations *do;* and that, consequently, a physician should recommend revaccination, when questioned as to its necessity. 3. A portion of vaccinated persons are protected from smallpox through life by one vaccination. 4. An indefinite number are protected only for a certain period of time. 5. The length of time they are thus protected is undetermined. 6. Some individuals requre to be vaccinated a number of times during life. 7. The system is protected from variolous contagion, when it is no longer susceptible of vaccine

influence, as tested by revaccination. 8. The cowpox virus does not seem to be more efficacious than the human vaccine virus in its prophylactic virtues, and the influence of the vaccine virus does not seem to be diminished by the number of its removes from the cow, or passages through the human system. 9. The appearances of vaccine cicatrices furnish no indication that the system may or may not be again influenced by repeated vacinations. 10. A plurality of vesicles have no more effect in rendering the system less obnoxious to the influence of revaccination than a single vesicle has. 11. The lapse of time from the period of primary vaccination to that of revaccination has some, though but little, effect in preparing the system to be further influenced by the vaccine virus. 12. The age of puberty tends in a great degree to destroy the effect of primary vaccination. 13. The virus contained in vesicles resulting from revaccination has the same anti-vaccine and anti-variolous power as that which is the product of vesicles produced by the primary vaccination." (p. 74.)

MIDWIFERY.

DR. ARNETH'S CLINICAL MIDWIFERY.

(Continued from page 247.)

Placenta prævia.—In 6527 labours, the author met with 9 cases of *placenta prævia*, or 1 in 725. Of these cases, 5 of the women were dismissed on the ninth day, 2 became ill, but soon recovered, 1 suffered from syphilis, and 1 died two days after delivery. Of the children, 4 were born living, 2 dying soon after. In 2 cases, the labour was left to nature; in 1, the waters were discharged; and in 6, turning was employed, one of these proving fatal. In 7 of the 9 cases, the labour was premature. In 3 cases, the presentation was cross; in 1, breech; and in 4, occipital. Bartsch observed one case of *placenta prævia* in 398 labours; Klein, one in 760; Collins, one in 1492; M'Clintock and Hardy, one in 829; and Hoffman, one in 472. From the consideration of his own and others' cases, Dr. Arneth concludes:—1. That the proportion of labours with *placenta prævia* to normal labours is very different in different institutions. 2. That the mortality of the mother varies. 3. That the abnormal position of the placenta frequently indicates the advent of labour before the expiration of the natural period of pregnancy. 4. The *placenta prævia* is more frequently found in pluriparæ than in primiparæ. 5. Preternatural presentations are of much more frequent occurrence when the placenta is thus attached.

Extraction of the Placenta.—When internal or external hæmorrhage does not call for interference, the author leaves the separation of the placenta entirely to the uterine contractions; but, if it is not thrown off in three hours, and slight traction does not suffice, the entire hand is passed into the uterus, and its separation accomplished, if, as not unfrequently happens, the introduction of the hand does not excite the uterus to expel it. Numerous observations prove that a longer delay only renders the operation, which yet will have to be undertaken, more difficult, in consequence of the womb contracting closer around the placenta. In 6527 labours, such introduction of the hand was required

in 31 cases, *i. e.* 1 in 210 ; 14 times on account of hæmorrhage, 11 for more or less adhesion of the placenta, and 6 for a combination of hæmorrhage with such adhesion. From these two last categories, 5 mothers died. From a consideration of his own and the Dublin cases, the author concludes :—1. The operation is required once in about 225 labours. 2. It is a very dangerous one, at least when the placenta is adherent. Above one half of such patients became ill, and near a third died ; while only one seventh became ill when the placenta was extracted on account of hæmorrhage only. The detention of the placenta from spasmodic action is very dangerous ; for, of Collins's cases, a third died ; while all the others, which underwent turning for other causes, recovered. 3. Of Collins's 10 cases of adherent placenta, 6 occurred in pluriparæ, and 4 in primiparæ. Of the author's 7 cases, 4 belonged to the former, and 3 to the latter. Of Hardy and M'Clintock's 11 cases, 10 were pluriparæ. 4. Detention from spasmodic action occurred once in 6634, in Hardy and M'Clintock's cases ; once in 1631, in the author's ; once in 864, in Collins's cases ; and once in 682, in Hoffman's.

Hæmorrhage.—In respect to this, the author only furnishes his experience for one year, during which, in 3452 labours, 84 cases of hæmorrhage were observed, or 1 in 41. Of these 84 cases, 3 were examples of placenta prævia ; and 74 occurred soon after the birth of the child, of which number 10 died, as well as 10 children ; 13 children of the whole 88 being born dead. Collins met with a case of hæmorrhage in every 125 labours ; M'Clintock and Hardy, 1 in 17 ; and Hoffman, excluding cases of placenta prævia, 1 in 40.

Eclampsia.—Among 6527 labours, 13 cases of eclampsia were observed, or 1 in 502. Collins observed 1 in 547 ; M'Clintock and Hardy, 1 in 510 ; Bartsch, 1 in 398 ; Boivin, 1 in 1071 ; and Lachapelle, 1 in 434. Of the 13 cases, 8 are indicated as primiparæ, but in 2 the circumstance is not stated. In 12 of them, the head presented. In 2 cases, the convulsions came on with the earliest pains ; in 5, during the dilatation of the os ; in 3, when the head was already deep in the pelvis ; and in 1, two days after labour. In 2, no statement is furnished. In 9 cases, attacks recurred after the labour was over. In 6 of the cases, labour was completed by the forceps, the others being completed by the pains. Of the mothers, 4 died ; 1 was seized with mania ; and the others were, sooner or later, dismissed well. Of the 14 children, 3 were born dead, and 3 others died within a few days; 10 of the children were male, 4 female. Ramsbotham's opinion, that eclampsia especially occurs in hot weather, is not borne out by these cases, the great majority of which occurred in autumn and winter. The following points may be taken as proved :—1. Eclampsia especially attacks young primiparæ. 2. The proportion of cases, in a given number of births, varies. 3. About a fourth of those attacked die. 4. The majority of the children belong to the male sex. 5. In fatal cases, no changes in the brain, which can be regarded as the cause of death, are found. Points which yet require to be cleared up are :—1. The frequency of the continuance of the attacks after the completion of labour. 2. The mortality of the children. And 3. the influence of the weather.

Twins.—In 6527 labours there were 81 twin-births, *i. e.*, 1 in every 80. Of these 61 were at full time, 20 premature. There were 80 boys born living (14 dying in a few days) and 5 dead, 74 girls born living, 19 died) and 3 dead. In 73 cases both children were born living, and in 33 both with occipital presentation. In no case were both children born dead. In 51 cases both children were of the same sex. The proportion in 129,172 births occuring at the Dublin Hospital, was 1 in 62; during Collins's mastership 1 in 68; and as reported by M'Clintock and Hardy 1 in 69. Lachapelle reports 1 in 78, Boivin 1 in 132, Klein 1 in 107, Bartsch 1 in 104, Spengler (Mechlenburgh, Schwerin) 1 in 65, and Hoffman (Wurzburg) 1 in 62. In the Second Clinic of Vienna, in 39,121 labours, the proportion has been 1 in 87. The following are Dr. Arneth's conclusions:

"1. That twin-births are met with seldomer at Vienna than at Mecklenburgh, Wurzburgh, and Dublin; but they do not observe the same proportion to single births in different years. 2. About a fourth part of all twin births are premature. 3. Hæmorrhage occurs more frequently after twins than after single births. While this occurred only once in 42 of the births in general, it was met with once in 16 in twin-births. 4 By far most frequently, both children are born with the occipital presentation. Next follows the case in which the first or second child presents with the occiput, the other with the breech. The other varieties of presentation are more rare; but beyond all others that is most uncommon, in which both children are placed crosswise. 5. In Dublin, as well as in Vienna, three-fifths of the twins occurring at the same birth, are of the same sex. 6. Most of the children at Vienna (154 out of 162) are born living: and among our cases, in more than three-fourths of the whole, both children were so, and continued living until the ninth day. In only 8 cases were a dead and living child born; and in no case (in 9 of Collins's it occurred) were both children born dead. 7. Eclampsia occurs much more frequently in twin-births, for while in our cases and those of Collins's it was met with only once in more than 500 labours, it occurred to us once in 81 twin-births, and to Collins three times in 240. 8. While in our cases we met with 1 death in 51 labours, we had three deaths in 81 twin-labours. Collins lost one woman in 100 labours, and 7 in 240 twin-labours; and M'Clintock and Hardy lost 1 in 102 labours, and 1 in 47 twin-labours. 9. In the few cases in which this was noted, we found 19 pluriparæ to 1 primiparæ, while in the entire number of labours, 15 primiparæ occurred for 19 pluriparæ. Collins found 72 primiparæ for 168 pluriparæ, while there are three and a half times as many pluriparæ as primiparæ admitted into the Dublin Hospital. M'Clintock and Hardy met with 32 primiparæ out of 95 twin cases, being the ordinary proportion." (p. 221.)

Premature Labour.—In 3452 labours, which occurred during one year, 243 women failed to reach their full time, that is, 1 in 14. Among the 255 children which they bore, there were 19 who offered a foot-presentation, 21 breech, 2 face, and 2 cross-presentations. In 12 instances there were twin-births. There were born 89 living and 31 dead males, 100 living and 34 dead females. Three mothers died, and 8

became ill, but recovered. Prof. Klein has met with 1 premature birth in 47, Bartsch 1 in 20, and Hoffman 1 in 12.

Still-born Children.—During the two years, of the 6608 children, 6384 were born living, and 224 dead (118 males, 106 females.)

In conclusion, we may again express our satisfaction with Dr. Arneth's little work, which, from the exactitude of most of its details, will always be in future referred to, whenever statistical results have to be brought to bear upon questions of obstetrical practice.—*British and Foreign Medico-Chirurgical Review, October* 1841.

GENERAL ORDERS.

PROMOTIONS.

G. O. C. C. 1st April 1852.—2nd Dresser M. Veerasawmy, No. 88, to 1st Dresser, from 22nd March 1852, vice A. Atchiah, No. 25, deceased.

G. O. C. C. 19th May 1852.—The undermentioned Native Medical Pupils having received Certificates of Qualification for the public service as 2nd Dressers, are promoted to the grade of 2nd Dressers from the 27th April, 1852.

1st class Native Medl. Pupil	....Cajah Fareed Obden.....	No	323—to complete Establishment for Sub Collector's Department Tinnevelly.
do	...Nathamoonee.....	,,	350—vice C. Seethapauthy, No. 108, deceased.
do	...T. Rasuntheram.....	,,	338—vice Mooniapen, No. 73, promoted.
do	...V. Yeatherajooloo.....	,,	326—vice Rungayah, No. 74, promoted.
do	...M. Appavoo.....	,,	362—vice Lutchmiah, No 75, promoted.
do	..A. T. Appavoo.....	,,	311—vice T.J. Sathooiyah No. 78, promoted.
do	...C. B. Sashadree Naicker	,,	381—vice C. Narrainsawmy, No 202, dec.
do	...Jay Singh.....	,,	339—vice Chinnatomboo, No. 76, promoted.

G. O. G. 21st May 1852.—No. 92.—The following promotion is made in the Subordinate branch of the Medical Department.

Acting Assistant Apothecary Robert Alexander Leonard, to be Assistant Apothecary from the 14th November 1851, vice Atkinson, deceased.

G. O. G. 28th May 1852.—No. 100.—Assistant Surgeon William Aitken, M. D., who was permitted to return to Europe on Medical Certificate as notified in G. O. G. 11th May, 1852, No. 86, embarked at Calcutta on board the Steamer "Pottinger," which vessel parted with the Pilot at Sea, on the 5th of May, 1852.

REMOVALS AND POSTINGS.

MEDICAL OFFICERS.

G. O. C. C. 17th April 1852.—Assistant Surgeon J. E. Dickenson, from doing duty 2d Battalion Artillery, to do duty Left Wing H. M.'s 25th Regt. N. I.—To join on the 1st Proximo.

MEDICAL SUBORDINATES.

G. O. C. C. 1st April 1852.—1st Dresser M. Veerasawmy, No. 88, from (late promotion,) to Sub-Collector's Department, Cumbum.

2nd Dresser Appiah, No. 150, from 34th Light Infantry, to Jail of Vizagapatam.

G. O. C. C. 2nd April 1852.—2nd Class Native Medical Pupils Mooneasawmy, No. 364, A. Ramasawmy, No. 368, and A. Davasegaumony, No. 375, from 43rd Regt. N. I., to 51st Regt. N. I.

G. O. C. C. 17th April 1852.—2nd Dresser C. Nieneappah, No. 183, from Dispensary at Chittoor, to General Hospital.

2nd Dresser A. Fegrado, No. 155, from Supg. Surgn.'s Dept. Presidency Division, doing duty Collector's Department Northern Division of Arcot, to Collector's Department Northern Division of Arcot.

2nd Dresser G. Vencatasawmy, No. 188, from Collector's Department Northern Division of Arcot, doing duty Dispensary at Chittoor, to Dispensary at Chittoor.

G. O. C. C. 19th April 1852.—Passed Medical Apprentice—C. Georges, from doing duty Lying-in-Hospital, to do duty Chintadrapettah Dispensary.

Passed Medical Apprentice, R. Wilkins, from Dispensary 2d District, to 1st Battalion Artillery.

Passed Medical Apprentice H. Hackett, from Eye Infirmary, to H. M.'s 84th Regiment.

Passed Medical Apprentice J. Gray, from General Hospital, to Head Quarters H. M.'s 25th Foot.

Passed Medical Apprentice J. Butler, from Lying-in-Hospital, to 1st Madras Fusiliers.

Passed Medical Apprentice P. Anderson, from Left Wing H. M.'s 25th Regiment, to H. M.'s 15th Hussars.

Passed Medical Apprentice E. A. Etridge, from Lying-in-Hospital, to H. M.'s 84th Regiment.

Passed Medical Apprentice J. Howard, from Eye Infirmary, to Leper Hospital.

Passed Medical Apprentice J. Sausman, from General Hospital, to 2d Battalion Artillery.

Passed Medical Apprentice C. W. White, from Left Wing H. M.'s 25th Regiment, to Government Dispensary.

Passed Medical Apprentice D. Karney, from Eye Infirmary, to Detachment Artillery at Trichinopoly.

Passed Medical Apprentice C. J. Ambrose, Lying-in-Hospital, to 51st Regiment Native Infantry.

Passed Medical Apprentice W. Thomas, from Triplicane Dispensary, to 4th Battalion Artillery.

Passed Medical Apprentice C. Smith, from Left Wing H. M.'s 25th Regiment, to 2d European Light Infantry.

Passed Medical Apprentice J. Ringrow, from Left Wing H. M.'s 25th Regiment, to H. M.'s 15th Hussars.

Passed Medical Apprentice C. Marrow, from Eye Infirmary, to 2d European Light Infantry.

Passed Medical Apprentice J. W. Lewin, from Eye Infirmary, to 1st Madras Fusiliers.

1st Dresser Chinnean, No. 85, from Zillah of Honore, to 3d District.

2d Dresser P. Namasevayan, No. 133, from doing duty Jail and Depot Cuddalore, to do duty Triplicane Dispensary.

2d Dresser Sawmypillay Appasawmy, No. 161, from doing duty Supg. Surgn.'s Dept. Southern Division, to Civil Establishment Tranquebar.

2d Dresser A. Hyasawmy, No. 128, from 6th Regiment N. I., to Zillah o Honore.

2d Dresser V. Cothandaram, 215, from 50th Regiment N. I., to Zillah of Rajahmundry.

2d Dresser Cajah Fareed Odeen, No. 323, from (late promotion) to 46th Regiment N. I.

2d Dresser Nathamoonee, No. 350, from (late promotion) to do duty Supg. Surgn 's Dept. Southern Division.

2d Dresser T. Rasuntheram, No. 338, from (late promotion) to 38th Regiment N. I.

2d Dresser Yeatherajooloo, No. 326, from (late promotion) to 34th Regiment N. I.

2d Dresser M. Appavoo, No. 362, from (late promotion) to do duty Dispensary at Kamptee.

2d Dresser A. F. Appavoo, No. 311, from (late promotion) to 20th Regiment N. I.

2d Dresser C. B. Sashadree Naicker, No. 318, from (late promotion) to 10th Regiment N. I.

2d Dresser Jay Singh, No. 339, from (late promotion) to do duty 48th Regiment N. I.

MISCELLANEOUS.

G. O. C. C. 30th March 1852.—Assistant Apothecary W. Wood, of the Supg. Surgeon's Department Presidency Divison, doing duty at the General Hospital, is appointed to afford medical aid to the Recruits and Details (with families) of the 9th and 35th Regiment N. I. under orders to march on the 2d Proximo to Wallajahbad and Arnee, returning from the latter station of Madras.

G. O. C. C. 1st April 1852.—Apothecary F. H. Edwards, of the Superintending Surgeon's Department Presidency Division, is appointed to afford Medical aid to the camp of H. E. the Commander-in-Chief, under orders to proceed to Bangalore and Ootacamund.

G. O. C. C. 2d April 1852.—With the sanction of the Right Honorable the Governor, Surgeon W. Gilchrist, M. D. Acting Surgeon of the General Hospital, is appointed a Member of the Board of Medical officers for the examination of sick officers, Vice Surgeon J. Kellie relieved.

G. O. C. C. 3d April 1852.—With the sanction of the Right Honorable the Governor, Gorrison Surgeon R. Cole, of Fort St. George, will accompany H. E. the Commander-in-Chief on his approaching Tour of Inspection, and afford Medical aid to Head Quarters, Escort and Public Followers during the Tour.

G. O. C. C. 7th April 1852.—Assistant Apothecary W. Miles, of the Superintending Surgeon's Department Southern Division, having been reported fit to return to his duty, the unexpired portion of the leave of absence on Medical Certificate granted him in G. O. C. C. of the 14th February last, is cancelled from date of joining his department.

Assistant Apothecary E. Thompson of the 1st Battalion Artillery, having boen reported fit for duty, the unexpired portion of the leave of absence on Medical certificate granted him in G O. C. C. of the 13th September last, is cancelled from date of joining his Battalion.

G. O. C. C. 7th April 1852.—Assistant Apothecary W. R. Kierulf, attached to the Leper Hospital, is appointed to afford Medical aid to the bearers proceeding on the "Isabella Hercus" to Burmah, whence he will return to rejoin his Department.

G. O. C. C. 12th April 1852.—1st Dresser, Rungayah, No. 74, doing duty at the Chintadrapettah Dispensary, is apointed to afford Medical aid to the Bearers proceeding on the "Gemini" to Burmah, whence he will return to Madras.

With the sanction of the Right Honorable the Governor, 2d Dresser D. Marian, No. 165, attached to the Garrison of Fort St. George, is appointed to

afford Medical aid to the Drivers proceeding on the "Defiance" to Burmah, whence he will return to Madras.

G. O. C. C. 17th April 1852.—2d Dresser Vencatasawmy, No. 81, attached to the Depot at Poonamallee, is appointed to afford Medical aid to the Detail of 2d Light Cavalry under orders to march from Madras on the 20th Instant, to rejoin its Regiment at Bangalore until relieved by a Medical Subordinate from the Mysore Division.

G. O. G. 27th April 1852, No. 75.—The following extract from a letter from the Honorable the Court of Directors in the Military Department, dated 7th March 1852, No. 20, is published for the information of the Army. 2. The undermentioned Officers have been granted extensions of leave for the periods, specified, viz.:

Assistant Surgeon J. Matheson, M. D. 6 months.
Do. John Arthur, M. D. 1 month.

Assistant Surgeon A. H. Ashley, has been permited to retire from the service on account of his health.

G. O. G. 30th April 1852. No. 78.—Veterinary Surgeon Thomas Ashton is permitted to rejoin his appointment of Veterinary Surgeon to the Right Honorable the Governor's Body Guard, at his own request, from the 1st May 1852.

In the Judicial Department under this date, Assistant Surgeon William Scott, M. D., Zillah Surgeon Salem, has been permitted to proceed to Bangalore and Neilgherry Hills on Medical certificate, with leave of absence for five months, under the provisions contained in the Resolution of the Government of India of the 22d of November 1852.

G. O. G. 19th April 1852.—The following transfers are ordered of men found unfit for further service.

Medical Department attached to the Zillah of Rajahmundry, 1st Dresser Yaterajooloo No. 54.—Pensioned on half pay from 15th May 1852.

Medical Department attached to the 3d District, 1st Dresser Veerasawmy, No. 49.—Pensioned on half pay from 15th May 1852.

G. O. C. C. 23d April 1852.—Apothecary J. Mathews of the Superintending Surgeon's Department Centre Division, is appointed to afford Medical aid to the Details (with families) of the 43d Regiment N. I. under orders to proceed from Madras on the 26th Instant to Arnee, whence he will rejoin his Department.

G. O. C. C. 30th April 1852.—Return of Examination in the Native Languages for the month of April 1852.

Assistant Surgeon J. E. Dickinson, Passed the Examination prescribed for Medical charge.

G. O. G. 11th May 1852, No. 86.—The following General Order by the Most Noble the Governor General of India in Council, is republished for the information of the Army.

Fort William, 29th April, 1852, No. 276 of 1852.—Assistant Surgeon William Aitken, M. D., of the Madras Establishment, is permitted to proceed from hence to Europe on furlough on Medical certificate.

G. O. C. C. 11th May 1852.—2d Dresser V. Condasawmy, No. 240, is removed from doing duty at the Government Dispensary, to do duty at the Native Infirmary, during the indisposition of 1st Dresser Permall Naick, No. 46.

G. O. C. C. 17th May 1852.—The leave of absence granted to Apothecary R. Harper, of the Superintending Surgeon's Department Nagpore Subsidiary Force, in G. O. C. C. 25th October 1851, is to be considered as having commenced from the 26th January 1852, and to extend for 8 months from that date.

G. O. C. C. 19*th May* 1852.—The leave of absence granted to Apothecary

H. Eason, of the Pension Establishment, in G. O. C. C, 6th March 1852, is to Salem and Bangalore.

The undermentioned Medical Apprentices have obtained Certificates of Qualification for the grade of Assistant Apothecary from the Medical College at the public examination of that Institution on the 27th Ultimo, from which date they are to be considered as Passed Medical Apprentices.

Passed Medical Apprentices Charles Georges, Richard Wilkins, Henry Hackett, Jeremiah Gray, John Butler, Peter Anderson, Edwin Augustus Etridge, John Howard, Joseph Sausman, Charles William White, Daniel Karney, Charles Jacob Ambrose, William Thomas, Charles Smith, John Ringrow, Charles Marrow and John William Lewin.

G. O. G. 18th May 1852, No. 88.—The following Extract from a letter from the Honorable the Court of Directors in the Military Department, dated 7th April, 1852, No. 25, is published for the information of the Army.

We have permitted the undermentioned Officer to return to his duty, viz.

Assistant Surgeon J. T. Blenkin.

Mr. Edward D'Arcy Evegard, who arrived at Madras on the 17th May 1852, is admitted upon the Establishment as an Assistant Surgeon in conformity with his appointment by the Hon'ble Court of Directors, and directed to do duty under the Surgeon of the 1st Madras Fusiliers at Bellary.

G. O. C. C. 25th May 1852.—Senior Medical Apprentice J. C. Watson attached to the Medical College, is reduced to the rank and pay of a Junior Medical Apprentice from this date.

The undermentioned Junior Medical Apprentices having been recommended by the Medical College Council for removal from the public service for the reasons stated against their names, are to be discharged from the 31st instant.

Junior Medical Apprentice.	G. Owen,	In consequence of inattenton, carelessnes and incompetency.
Do.	J. Haye,	In consequence of incompetency
Do.	J. White,	
Do.	W. McQueen.	

G. O. C. C. 27th May 1852.—With the sanction of Government, Private Student Thomas Joseph Riely is admitted on the Establishment as a Passed Medical Apprentice from the 27th Ultimo, to be borne as a Supernumerary until absorbed by a Casualty.

Passed Medical Apprentice T. J. Riely is appointed to do duty with the Detachment of Artillery at Bellary.

LEAVE TO MEDICAL OFFICERS.

G. O. C. C. 17th April 1852.—Surgeon J. Supple, 12th Regt. N. I., from 20th March 1852, to 30th June 1852 Bangalore and Neilgherry, s. c.

G. O. C. C. 15th May 1852.—Assistant Surgeon G. E. Aldred, M. D., Medical Department from 30th April 1852, for 3 months, Madras, s. c.

MEDICAL SUBORDINATES.

G. O. C. C. 10th April 1852.—Assistant Apothecary H. Hitchcock, 18th Regt. N. I., from 25th March 1852, to 25th November 1852, Madras and St. Thomas's Mount, s. c., under the provision of para. 5 page 260 Section 18 of the General Regulation.

G. O. C. C. 17th April 1852.—Apothecary H. W. King, Supg. Surgn. Dept. from Saugor Division, in continuation 31st October 1852, to Cuddalore, s. c.

Assistant Apothecary J. Harris, 46th Regt. N. I., from 31st March 1852, to 31st December 1852, Madras and Eastern Coast, s. c.

Assistant Apothecary P. Heron, 12th Regt. N. I., from 26th April 1852, to26th July 1852, Madras.

PART FIRST

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Remarks on Cholera.* By Student W. BAKER.

(*Continued from page* 268.)

1. Usually the first symptom experienced by the patient is *nervous depression,* which in the first instance is probably produced (as above stated) by the supply of poisoned blood to the nervous centres. The heart thus deprived of a portion of its nervous stimulus does not propel the blood, with a sufficient amount of force—the small amount of blood which they (the nervous centres) in common with all other parts of the body consequently receive, tends to depress their energy still more,—and this depression again acts upon the heart in a similar way. A mutual exchange of cause and consequence is thus effected until the congestion becomes complete and universal, and then the nervous power, (and with it life) is totally extinguished.

2. The *nausea,* experienced in the first stage of the disease, depends upon innervation, and unless the stomach is loaded at the time it rarely produces vomiting. As an illustration of this it may be mentioned, that in recovery from collapse, nausea is felt from a similar cause.

3. *The coldness of the extremities, and of the surface generally* is also produced by congestion, assisted perhaps by the want of nervous power. The evolution of animal heat, depends principally upon the activity of the circulation, and is produced by the combination of the oxygen of the arterial blood, with the carbon of the effete tissues. The rapidity of the combination and consequently the amount of animal heat, depends as above stated upon the rapidity of the circulation, and it thence follows that when the blood is congested, less heat is given out than is sufficient for the wants of the system.

4. *The lividity* (which cannot be well seen in a dark skin) depends upon congestion of the superficial capillaries. This is so well marked in some cases, as to procure for it the name of "blue cholera."

5. *Vomiting and Purging* are also results of congestion, and the consequent exudation of serum, which is poured into the stomach and intestinal canal. But there is also some degree of irritation present in the mucous lining of these organs which determines the supply of blood, from which this enormous quantity of serum appears to be expressed.

That the principal constituent of these evacuations is serum cannot be doubted; and it appears that the vessels of the part are so loaded with blood which cannot be circulated, that the exudation of serum from their coats is only the mechanical effect of their own distension. But to this explanation it may be objected that as congestion is universal, why does it not follow that the effusion is equally so? To this it can only be answered that in other parts the congestion has overcome the vital contractility of the vessels, and therefore serum cannot be effused; but that in the stomach and intestinal canal the presence of an irritant, stimulates them to contract, and thus expel their more fluid contents.

The first few vomiting and purgings consist of the ordinary contents of the stomach and intestinal canal, and then follow the rice water like evacuations which characterise the disease.* This peculiar appearance is owing to the mixture of the epitheleal cells lining the mucous membrane of the *primæ viæ* with the serous effusion from the vessels.

6. *The muscular spasms* are probably owing to the condition of the nervous system which produces irregular contraction of the muscular fibres,

7. *Urine is not passed* because the congested state of the kidney prevents its secretion, and also because the liquid part of the blood has been appropriated to another purpose. The urea is not separated from the blood, and its retention doubtless tends to produce mischievous consequences where the circulation is re-established.

8. Bile is not secreted from a similar cause,† and the restoration of this function is a favorable symptom.

9. We have also sinking of the eyes, and anxiety of countenance—the results of great physical and mental prostration.

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* This appearance may be seen in any case in which the purging has been excessive, but it is more particularly a characteristic of cholera.

† There is what is called bilious cholera, that is vomiting and purging produced by the irritating affect, of an abnormally large quantity of bile in the stomach and intestines. It may prove fatal, and is sometimes confounded with true cholera.

These are the principal symptoms of the disease. Others occasionally present themselves, but they are the results of accidental complications

When the powers of nature or the means employed have overcome the disease, another set of symptoms present themselves, all referrable to exhaustion. Debility, dyspepsia, vertigo, pricking pains in the muscles, &c. The congestion which the viscera have suffered is likely to advance to inflammation, and to this circumstance our attention should be particularly directed.

Morbid appearances. None of these are constant, with the exception of a congested state of the vessels of the mucous membrane of the stomach and intestines.

When the pathology of a disease is obscure, its treatment is necessarily so, and in no one instance is this remark more applicable than to cholera.

A variety of remedies has been proposed, and the efficacy of most of them has been supported by very plausible arguments. Experience has however destroyed their reputation, and we are forced to acknowledge that we are yet ignorant of the proper treatment of a disease which has engaged the attention of the profession, and of the world at large for the last 35 years.

Dr. Bushnan in his work already referred to gives a copious list of the various formulæ, which have been recommended, some of them, by high medical authorities, and others again by non-professional persons, and if the subject did not command such a painful interest as it does, it would be amusing to read over the different plans of treatment brought forward by different individuals, and the heterogeneous and irrational elements of some of the vaunted prescriptions. There are but few substances in the whole range of the Materia Medica, which have not been pressed into the service at one time or another, and from the number of these being frequently employed together, one might fancy that their authors had some vague hope of including among them, by some piece of good luck, the remedy of which they were in search.

"The patient dies from the effects of hypercatharsis, bung him up" says one, and accordingly opium, tannic acid, and even actual plugging has been resorted to, "vomiting is the most distressing symptom," says a second "therefore give him hydrocyanic acid or creasote and blister his epigastrum," "correct the secretions" says a third, "bleed

him" says a fourth. "Give him cold water" says one, "don't do so say the rest, it will only irritate his stomach." "Inject warm water or a solution of salt into his veins" echoes his neighbour. "Give him the saline treatment" adds somebody else "you are all wrong" cries some one who has studied the subject. "The poison is in the system, and the vomiting and purging are only the means whereby nature endeavours to throw it off, therefore you should encourage instead of stopping them." "Give Emetics and purgatives." The patient dies of mal-oxygenation of the blood, it should therefore be oxidized for him writes another party. But enough of this,—one objection applies to them all. The circulation is slow, and while this is the case, the medicines cannot be absorbed in sufficient quantity or with sufficient celerity. In the meantime, the disease is approaching its consummation, and before the remedy can have any marked effect, the patient dies.

Another formidable difficulty presents itself at the very onset. In the majority of cases, the remedy cannot even be retained in the system. They increase the irritation of the stomach and the consequent vomiting, thus precluding any possibility of their own efficacy, while the effort necessary to evacuate the stomach adds greatly to the already exhausted condition of the patient.

This is certainly very discouraging; but a medical man cannot look on, and see the approaches of certain death, without doing all in his power to afford relief, and the previous efforts give but little encouragement, he should nevertheless persevere in some method which past experience and sound reasoning points out as the best. Among the immense number of therapeutic agents already referred to—some have attained greater celebrity than others, and upon the efficacy and *modus operandi* of the most reputed of these, I shall make a few observations.

1. *Bleeding* has been recommended and practised by several, and it is believed with some success. Arguing from physiological principles, great benefit might be expected to be derived from it. Congestion is present from the want of the propulsive force of the heart, and by lessening the amount of blood in the system, we give the heart less work to do, and thus enable it to act more freely. Unfortunately however we have seldom an opportunity of using it with any chance of success. There are only two stages of the disease in which it ought to be used,

and the first of these is, when the heart commences to labour in its action, before the congestion has become marked, and the nervous power consequently diminished. But when a patient presents himself for treatment the time for bleeding has usually gone by, and if performed then, we can scarcely extract more than a few drops of blood.

The other stage of the disease in which this agent might be employed is, shortly after reaction has been re-established either by the effects of nature or of art. The heart rouses itself or is roused to a proper performance of its function, and it endeavours to propel the large amount of blood which has hitherto been at a stand still. But it is so weak that it frequently fails in the efforts, it is not at all equal to the immense labour it has to accomplish, and after some few struggles it relapses, and ere long totally ceases to act.

If in this stage some blood were extracted, the heart would, as before stated, have less work to do. Less force will be required to propel the smaller amount of blood in the system and there is therefore less probability of the heart's relapsing into inactivity.

2. *Opium* has been employed largely either alone, or in combination with other medicines. It is however an improper agent. It exerts a bad effect upon the secreting organs, depriving them of their power which on the contrary should be stimulated. It favors congestion and should therefore be avoided. It certainly does sooth the irritability of the stomach sometimes, but even in this it often fails, and the injury it always inflicts is too great to be overlooked for its slightly salutary effect. The only benefit which might be expected from its use, is the stimulating effect of small and repeated doses—but this soon fails, and while we have better stimuli at hand, we need not have recourse to such a dangerous one as opium decidedly is.

3. *Mercury* was generally employed when the disease first made its appearance, and at the present day it is a favorite with some Medical practitioners. At first it was probably administered, with no decided ideas of its efficiency. The disease was evidently powerful. Mercury is a powerful remedy—and this was held to be a sufficient reason. Before long, it was known, that in cholera the secretions generally and that of the liver in particular were either absent or depraved and mercury being known to possess a salutary effect in this state of the system, it was taken advantage of. This is really the case. The secret-

ing organs do not act. The blood contains the poison which might be removed by the processes of secretion and excretion. Mercury is administered to alter this condition, and were it not for the state of the circulation we might reasonably expect to suceeed by its use.

4. *Tonics* (and of these quinine) have been frequently used, but what is their *modus operandi* it is impossible to say. Their stimulating property, is probably the only curative power they possess. Quinine is seldom administered alone. It is generally combined with sulphuric acid, and the large amount of oxygen which this latter material possesses is no doubt the source of its efficacy.

5. *Stimulants* are in my poor opinion the *sine qua non* of the treatment of cholera. A patient may recover from the disease without having taken any. So he may from any disease, without being treated for it—merely because the force of life is stronger than that of the disease. The *vis inertiæ naturæ* (to use a rather pedantic expression) very often recovers a patient even in spite of treatment, and the original attack may have been so slight as to leave him in no danger of a fatal termination of it. But when the disease is fully established, stimulants are necessary—and the very nature of cholera points this out as the most obvious and rational method of treatment. Nervous depression and consequent vascular inactivity exist, and can these be better counteracted than by stimuli? Certainly not. They should be administered in small quantities, and at short intervals until reaction is fairly established. Then,—when the pulse has become perceptible, and has reached a certain amount of force and frequency, they should be *gradually* discontinued. If persisted in too long there is danger of excessive reaction, and on the other hand, if discontinued too soon, or too suddenly, the nervous depression is apt to return and with it all the other symptoms when it is almost impossible to recover the patient, his vital powers are worn out and cannot be again aroused into activity,—of all remedies of this class—alcoholic stimulants, and of these Brandy and Gin are the best. They do not require to be absorbed, and hence one of the great advantages they possess over other medicines. They can ensure their effect, by permeation and diffusion, and this is owing to their volatile nature; Ammonia is a very valuable agent but its effects are perhaps too transient, I have seen however at least one case successfully treated by it.

Oxygen is another valuable remedy of this class, and the curative effect of many medicines depends materially upon the quantity of this ingredient which they contain,—such as nitrous and other oxygen acids for instance, have been found beneficial in the treatment of cholera, most probably because, when taken into the system they become decomposed, and the oxygen thus liberated has a better chance of rousing the nervous power than a solid or liquid could have.

Oxygen thus taken into the system has another good effect in cholera. As sufficient animal heat is not formed, from the want of oxygen to combine with the carbon of the effete animal matter in the system, we can easily understand how, when artificially supplied, the necessary combination takes place and the warmth of the body restored to a certain degree.

Oxygen has been administered in a variety of ways. The pure gas has been inhaled, the patient has been wrapped in a blanket saturated with a solution of a decomposing oxidê, &c. &c.

Electricity has been employed, sometime as a stimulant, and at others with some vague idea of its beneficial effects upon the electrical condition of the system.

Phosphorus and phosphoric acid have also been employed as stimulants, and some others which I cannot afford to mention.

5. *The saline treatment* has been extensively used, both in this country and in England and from the alleged result of Dr. Stevens' method of using it, we might congratulate ourselves, upon possessing in it, a very effectual remedy. Dr. Bushnan's account of it in his work entitled, "cholera and its cures," is indeed very encouraging, and if as there stated the rate of mortality under this treatment is only 3 per cent., and is found to be never much more, we may at once place cholera upon the list of diseases, whose terrors have been overcome by the efforts of science. For all details regarding it, I beg to refer my readers to page 280 of this journal, and proceed to make a few remarks upon it.

In cholera the salts of the blood are removed with the serum, which forms the bulk of the evacuations; and as much of the vitality of the blood is believed to depend upon the presence of these salts, their absence is supposed to have much to do with the fatal termination of the

disorder. To counteract this a very dilute solution of various salts is administered, which getting into the blood vessels by *endosmosis* is thought to supply the deficiency, and among other things to prevent the tendency of the blood to coagulate, and to restore it to its normal condition.

All this may be very true : but we must not forget that most of the salts used are very rich in carbonic acid, and oxygen,—two very powerful stimulants which when liberated in the system by the decomposition of the salts would in all probability have the effect of rousing the powers of life from the depression they had previously suffered. I have seen the carbonate of soda used pretty frequently in larger and often repeated doses, and sometimes with benefit. But these were usually slight cases, which would probably have recovered, under almost any treatment, and I regard it more as a useful adjunct to more active treatment than a remedy which would justify reliance upon it alone.

The treatment of cholera by aperients, in order to carry off the *materies morbi* may be very well in theory, and can be supported by arguments in favor of the *humoral pathology.* But it is very bad practice for in the first place it is more than probable, that they will not be taken into the circulation and even if they were, the patient is not likely to be benefited by the additional drain upon the system which their effects must induce.

The copious use of liquids is indicated by the intense thirst of which the patient complains. The blood has been deprived of its watery parts, nature feels the loss, and true to instinct the sufferer cries out for water. It should be given, but in small quantities at a time, for the stomach is so irritated that a large bulk cannot be retained. It possesses however no curative effect, and unless the powers of life or the efforts of art interpose, the patient might drink and vomit and purge until he died.

After all however the Physician must be prepared to see his best concocted schemes baffled, and his most sanguine hopes disappointed. Cholera will slay its victims in spite of any thing which can be done, and the vanity of human knowledge, cannot be better illustrated than by this instance of its inability. We are almost forced to the conclusion that cholera when fully established is incurable.

ARTICLE II.—*Salivation produced by Iodine.* Communicated by Assistant Apothecary G. O'HARA.

A woman about 30 years of age had a cancerous tumor on the fore-part of the neck which, by her account, was at first small and hard, painful only when pressed. Having remained in this state for several months it gradually enlarged when she applied to a native for relief, who cut it open when profuse hæmorrhage occurred.

The tumor at the time of her applying for aid at the hospital, which was more than a month after it had been cut, was as large as an adult fist, occupying the entire front of the neck, and extensively ulcerated. It was a blastemal formation, consisting of a number of cells which gradually enlarged and on maturing burst, discharging a copious thin transparent fœtid fluid, at the same time generating a number of smaller cells which appeared to be developed within the primary ones, hence cells in different degrees of development from the size of a pin's head to that of a split pea were always present. The base and adjacent skin were tuberculated and freely supplied with blood vessels many of which had acquired considerable size. The patient complained of a constant excruciating pain in the part, her health was much impaired, countenance sallow and haggard and she was reduced much in flesh and strength.

After her general health had been somewhat improved, and extirpation of the tumor found impracticable, a course of iodine was tried. Four grains of the hydriodate of potass was ordered three times a day and the compound iodine ointment applied to the tumor. Three days after this treatment she complained of soreness of the gums which in a day or two more became greatly swollen and very tender, attended with a copious flow of saliva. Salivation becoming very severe the medicines were discontinued for a time when the pain and swelling of the gums subsided; some time after, the hydriodate of potass was again tried without the application of the ointment and all the symptoms of salivation re-appeared, the ointment was next tried alone and the same effects followed. The tumor gradually diminished in size, the discharge and pain lessened, pale flabby granulations were thrown out and some parts particularly the edges began to cicatrize.

Pressure was next applied to the base of the tumor but from its situation it could not have been done as effectually as wished, however

it tended much in reducing its size, so that the patient, thinking herself sufficiently well, left the hospital and never returned.

Salivation whenever induced in this case was free from that peculiar fœtid odour, disagreeable coppery taste, ulceration and bleeding of the gums as occurs from mercury.

ARTICLE III.—*General spasms affecting the whole body treated effectually with the disulphate of quinine.* By Assistant Apothecary J. DEAN.

When I was in medical charge of a small civil station about three years ago, a case of general spasms came under my observation and which I effectually treated with the disulphate of quinine. A very athletic musselman of about 28 years of age was brought to my residence suffering from a malady, which the natives around him said they did not know what to make of. At the time of my first seeing him he was perfectly free of any symptom of the disease, he spoke correctly but with apparent dread of something he expected to return every moment, after the lapse of about 4 or 5 minutes he said it was coming and pointed to his abdomen, on fixing my attention to this part I observed the muscles quiver at first and afterwards their fibres to contract into so many knots, the muscles of the chest next became similarly affected and the extremities in like manner had their muscles forcibly contracted in a vermicular manner, the face distorted, eyes staring and watery, countenance anxious, pulse excited and the patient exclaiming in great agony the whole time, this state continued for about 20 minutes when it left him to return in another half hour. I tried various antispasmodics but to no effect, and I thought next to bleed him from the arm, but on suggesting this to the patient and to his relation it was opposed to by them. I now commenced giving him 5 grain doses of the disulphate of quinine every half hour and the benefit from this was soon apparent, after taking the third dose the attack came on after longer intervals, they were of a milder character and lasting a much shorter time, I altered the doses from every half to one hour, and when he had taken four more the spasms left him altogether. The patient now dozed off into a sleep, and slept soundly all night. He awoke the next morning quite well, except feeling a slight dizziness in the head and some muscular pains of the body,

which an aperient removed, he returned to his village a day or two afterwards quite well and I never heard of this man since.

The most remarkable feature in this case is the absence of any assignable cause for the disease. The patient said he was quite well with all his functions unimpaired when he was suddenly seized with spasms. He had come off a short journey only the day before, and the district he had quitted was much infected with cholera. From this latter assertion can it be presumed that the individual was predisposed to this scourge and that it was lurking in the system and showed itself in the manner it did. No cholera prevailed at the station where I was at that time. The spasms in this case, particularly in the extremities, resembled that observed in cholera in a muscular man.

I have used the disulphate of quinine in 10 grain doses in cases of cholera with good effect, and one of them was in a state of collapse with slight spasms of the lower extremeties. It has been invariably retained on the stomach, when every other medicine was rejected.

ARTICLE IV.—*Case of Acute Hapatitis treated by* Assistant Surgeon J. ANDERSON, M. D., *3d Battalion Artillery.* Reported by 2d Apothecary J. FALLOON.

Gunner Matthew Sheean, Aged 43.—The subject of this case was admitted into hospital on the 2d December last, with severe and fixed pain in the epigastric region, where the slightest amount of pressure could not be borne. Free Vene Section was employed, and leeches repeatedly applied to the pained part—in all 48 ounces of blood were abstracted, (the first 16 oz. decidedly buffy) and 70 leeches applied, slight relief only of pain was obtained and which was not entirely removed until the system was brought under the influence of mercury, this took place on the 5th day after admission, when on examination a perceptible fulness of a circular form, about three inches in diameter, with the circumference about half an inch distant from the extremity of the ensiforn cartilage was observed, and to which a pulsation was communicated by the descending Aorta. The swelling continued daily to become more prominent until the 12th December, the 10th day of admission, when decided fluctuation was felt. An exploratory grooved needle was introduced, and on its withdrawal some

purulent matter oozed from the orifice left by the puncture, when no doubt existed as to the nature of the case, a good sized Trocar and Canula was introduced into the centre of the swelling in the median line, 8 oz. of thick healthy pus were discharged, without any inconvenience of moment to the patient, the Trocar was withdrawn, and the Canula left in the wound secured by tapes.

On the 5th day after the operation, the abscess had so far contracted as not to allow the Canula to be retained in the wound; plugs of lint were substituted, and the whole covered with a poultice. From this date (18th) until the final closure of the wound, the matter continued daily to diminish in quantity and for two days was of a bilious colour. With the exception of slight irregularity of the bowels, requiring for some days, the daily administration of a hot water enema and occasional luxatives, the patient progressed most satisfactorily, and by attention to diet and a daily allowance of Port Wine, he rapidly regained flesh and strength, and was discharged cured on the 23d January 1851. He has since obtained his discharge from the service as a time expired man, and has proceeded to the Presidency with a view to embark for Europe.

ARTICLE V.—*Acute Dysentery successfully treated with sulphate of soda.* Communicated by Assistant Apothecary R. BARROW.

A native, aged 40 of an irritable habit of body, presented himself for treatment on the 20th May 1852 at 5 p. m. complaining of being frequently purged with severe griping; since the morning he had about 12 motions, stools scanty and consisting of mucus tinged with blood. Had pain of the abdomen generally, but more so in the course of the descending colon, skin hot and dry, pulse frequent and small, tongue dry but clean, much thirst, nausea and headache with giddiness. He complained also of great weakness of the lower extremities. Could assign no cause for the complaint. He was subject to dysentery having had a similar attack at Cumbum.

The following medicines were prescribed on admission, calomel grains ten and opium one grain in a pill,—to be taken immediately. Hydr. c. creta gr. xij. pulv. ipec. gr. xij. extract catechu gr. ij. to be

divided into six powders, one powder to be taken every two hours.

The following is the recorded statement of his case as taken on the 1st day after admission.

Slept indifferently, took the powders during the night and the gums are now tender. Passed 9 scanty motions since last report with much griping and straining, stools are of a dark greenish color, offensive and streaked with blood. The patient complains of a fixed pain in the region of the cæcum, which, on examination, appears unnaturally full, vomited thrice during the night.

Heat of skin continued with augmented intensity until 5 o'clock this morning when it somewhat abated, and the surface now is warm and moist, *Pulse* frequent and very weak. *Urine* high colored and voided with scalding. *Tongue* covered with a thin film of mucus. Has a feeling of soreness in the rectum, and is troubled occasionally with cramps of the lower extremeties.

℞ Sodæ sulphas ℥j
Tinct. opii ʒij
Aquæ ℥ xxiv. M.
℥j every 2d hour.

After taking 3 doses of the above mixture the purging ceased, the tormina and tenesmus were relieved as also the irritability of the stomach, he retained some arrow root conjee which was given him to drink. The mixture was discontinued as soon as the purging ceased, and the patient the same evening passed two feculent stools without blood or slime, he recovered completely.

The above case is a good illustration of the rapid and efficacious result which ensues upon the administration of the solution of sodæ sulphas with tinct. opii in dysentery, what is the precise mode of operation of the remedy it is not easy to determine, but the fact of its being of very essential service in the disorder in question is, I think worthy to be recorded and I accordingly send you this for insertion into your journal if approved of. I have tried the solution in five other cases with equal success, in one, a young lady who used to get dysentery periodically, it not only checked the attack for which it was given, but has put a stop to the return of the complaint. In another person the dysenteric symptoms abated, but he died of peritonitis which I believe supervened in consequence of the

sudden cessation of the purging. This ought to be a caution in administering this medicine. It ought to be discontinued as soon as the purging ceases.

PART SECOND.

Notes of Professor A. BLACKLOCK'S Lectures on Medical Jurisprudence.

(Continued from page 278.)

MEDICAL EVIDENCE.

V. *Give your own personal experience, if possible. If you cannot strengthen or corroborate your opinion by giving your own experience, there will be no objection to your giving that of others.* You will have to live a long time, and have unusually ample opportunities for Medical observation and practice, before you will be in a position to explain or illustrate the peculiarities in any given medico-legal case, by the quotation of instances which have occurred in your own experience. But it may just so happen that you *have* seen a variety of cases, such as the one at the moment before the Court; and, if so, the ends of justice will be most readily promoted by explanations derived from what you have yourself personally seen of such matters. If you have not this personal experience, you must be prepared to give the Court the benefit of the recorded experience of your profession on the subject, and must select your instances from the published opinions of those who have devoted themselves most to enquiries into the matter in question. Some one has well observed that "Medical testimony is little else than a reference to authority," and when you are called upon for an opinion in Court you will be very apt to mix up recollections of your own experience with the experience of others, as you have derived it from their works. So far as you can be certain that your opinions are derived directly from your own experience, you will be to that extent received as an authority, and the Court will be impressed with their value in proportion as you afford self-seen instances in illustration of them. "For the most part it has been customary to estimate that witness first,

who vaunts highest of his experience. Frequently also a witness is examined as to the extent of this qualification, the meaning of the word being restricted in all cases to what he has himself seen or accomplished. Thus it must sometimes happen, that the fortuitous occurrence of being eye-witness to the operations that form the subject matter of our investigations, is allowed to supersede the knowledge that study alone can impart, and the exercise of a natural talent for digesting and assimilating the acquisitions of others."*

VI. *A book authority will be received when quoted, because any single individual's experience is very limited.* Or rather, the written and published opinion of a man who has acquired a reputation for his researches into the subject in dispute will be allowed by the Court to be quoted as authoritative on the point, because there are legal precedents to prove that such a proceeding is allowable. Formerly it was the practice in English Courts not to permit a reference to book authority in the testimony of a medical witness, though many reasons existed for a more liberal admission of opinion on subjects of which but few, even in large practice, could be expected to have much personal experience. "The practice," says a writer in the *Edinburgh Medical Journal*† when commenting some years ago on the evils arising from the exclusion of written authority in Criminal Courts, "of the English Judges in excluding a reference to authors evidently arises from the principle in law that nothing is evidence which is not delivered upon oath. But is an oath more binding than the solemn act of sincerity between the author and the world by the very act of publication? Would Paris and Foublanque be better authority if they swore to it before the twelve Judges? And is it not manifest, that if the exclusion be made to act systematically, it must inevitably end in excluding Medical and Scientific evidence altogether? For Scientific enquiries at law can scarcely be any thing else than a tissue of references to written authorities. Of what use would be all the personal experience of any physician, unless he knew, by referring to that of his predecessors, the conclusion he is entitled to draw from it"—One precedent in point, however, is more to our purpose than the most subtle arguments in favor of the practice, and such a precedent is quoted by Beck as follows. "When

* John Gordon Smith, M. D. on Medical Evidence p. 122.

† Vol. XIX p. 610.

Dr. Neale, on the trial of Donnal for poisoning, quoted Thénard, whose work on Chemistry is as much authority with physicians as Starkie and Phillips are with lawyers, Judge Abbot said, "we cannot take the fact from any publication. We cannot take the fact as related by any stranger." So also on the famous trial of Spencer Cowper, when some of the witnesses, referred to Medical authors on the subject of drowning, it was objected to by the bench. The expostulation of Dr. Crell on this deserves repetition. "My Lord," said he, "it must be reading as well as a man's own experience, that will make any one a physician; for without the reading of books in that art, the art itself cannot be attained to. I humbly conceive that in such a difficult case as this, we ought to have a great deference for the reports and opinions of learned men, neither do I see any reason why I should not quote the fathers of my profession in this case, as well as you gentlemen of the long robe, quote Coke upon Littleton in others "It is well to add that he was allowed to proceed."*

VII. *No hearsay evidence can be received, unless it has been a dying declaration under certain circumstances.*—You must speak of and from what you yourself know, and not from the reports of other people. If a dead body were found on the road and some one were to tell you that the deceased had been killed in some particular manner, you will not be allowed to come into Court and tell the story of the death as you heard it related. If you have not had personal cognizance of the circumstances, your narration of them will not be taken as evidence. In the case of Mrs. Mary Heath tried for perjury in Dublin in 1743 one of the witnesses, Dr. Jemmatt, was asked "Do you know whether she went on in her pregnancy? I gave her directions how to manage herself, but her disorder being what we call a *febris ephemera*, which lasted but three days, my wife and I dined with them at a third place, and after dinner, my wife, who saw her condition, went out with her, and returned again in a few minutes; and my lady told my wife.—*Court.* You are not to say what my lady told your wife, but only what you know yourself of her being with child. *Dr. J.* But I say, I gave her directions how to manage herself, and my Lord told me—*Court.* You are not to say what Lord, Lady, or anybody told you. Do you believe her to have been then with child? I do.—*Mr. Serjeant Marshall.* My Lord, I must insist

* Beck's Medical Jurisprudence 1842 p. 1093.

that we have by law, a right to ask that question ; in the very chapter of perjury in *Hawkins*, you will see it laid down as a rule, that hearsay evidence, that serves to illustrate what is the proper evidence before the court, shall be admitted.—*Court.* Hearsay evidence may be made use of to introduce material evidence; but when a witness has said all that is material, we shall not admit that."

In quoting another part of this case, Professor Thomson remarks in his lectures on medical jurisprudence* " as a general rule hearsay is properly not admitted as evidence; but the account given by a person, in answer to the questions of a medical man respecting health, is admitted as evidence, for it refers to what the person suffers from his bodily feelings. When such an enquiry is material, as, for example, when the evidence is to show what a person has suffered by reason of an assault, it is received ; but it is not received if it tend to charge another person as the cause of these sufferings. If, therefore, what a man has said to his Surgeon, respecting his personal feelings, be evidence in an action of assault, there can only be one opinion of the necessity of circumspection and accuracy on the part of the medical witness. It is just to reject hearsay evidence on ordinary matters ; and the English Courts of Law do so on the principle, that matters of fact can only be tried " by proof of witnesses upon oath before the judge ;" and, further, that the party making the declaration cannot be subjected to cross examination. But it would be unjust not to receive as evidence what a man has said of himself to his Surgeon, in an action for assault. In other cases connected with health, hearsay evidence is also admitted. Thus, in a case, or an action on a policy of life insurance (Aveson *v.* Lord Kennaird recorded in *East's reports*, vi., p. 188-198) the account which the deceased gave some days after she had obtained the certificate of health, respecting her condition on the former day, was admitted as evidence on the part of Lord Kinnaird, the defendant, and adjudged by the Court of King's Bench to be properly admitted. It is true that the admission of such evidence may lead to abuse in some cases, as, for example, where an assault has been extremely slight ; but it is the duty of the Surgeon to modify the statements of the Complainant by the power of judging of its truth, which his skill affords. The force of this evidence is thus explained by Mr. Amos, in one of his printed lectures ; " This kind of

* Lancet 136—7· vol I. p. 117.

evidence," says he, "of a person's own statement of complaints and symptoms, is admitted on the ground of its being part of what the lawyers call the 'res gesta,' being not evidence of a by-gone fact, but part itself of a fact which it accompanies, and necessary to show the true character of that fact." This distinction is displayed between the evidence in the GARDNER Peerage, where women related that they carried their children in pregnancy eleven months, and the evidence in the ANGLESEA peerage, which was a trial which lasted fifteen days, and related "to a suppositious birth, where Dr. Jemmatt, a physician, who had felt Lady ALTHAM'S breasts, and found them turgid, and spoke to her having yellow spots coming out upon her, and her making what he called *long spits*, as if she were with child. *The Doctor was allowed to state*, that he asked Lady ALTHAM if she was with child, and that he made various particular enquiries respecting her then state of health, *and also to give in evidence Lady* ALTHAM'S *answers*. The physician's evidence in this case was supported by that of an Irish maid servant, who deposed that—Lady ALTHAM, who was of small stature, 'had a little big belly.'"

Hearsay in general cannot be admitted as evidence for the plainest of all reasons, that, though the witness is on oath before the Court, the person who was his informant did not speak upon oath in giving his information. But none of the objections against ordinary hearsay evidence apply to what are called *death bed declarations* provided it can be proved that the deceased at the time of making the declaration firmly believed himself to be in a state of danger and had given up hopes of recovery. It is not necessary that the person should have given up *all* hopes of recovering; but he must express by his words or actions such a conviction of the probability of his dying from the present accident or illness that he will speak the truth as certainly as if he were under an oath.* If you are present at the sick bed of any one who has to make a statement which may criminate another, and become the subject of judicial investigation, you ought first of all to assure yourself that he believes himself to be moribund, and then ascertain

* The Circular Orders of the Foujdaree Adalut insist upon *all* hope having been given up :—"It being necessary in order to the admission of a dying declaration in evidence, that it should be satisfactorily proved that the deceased at the time of making the declaration was conscious of danger, and had given up all hope of recovery—the Court of Foujdaree Adalut direct the attention of the several Session and Criminal Judges to the importance of duly investigating this fact, whenever such declaration may be evidence in a case of homicide."—*C. O. 24th Nov.* 1832.

whether his mental faculties are sufficiently entire to enable him to make a statement that can be relied upon—You can inform yourself of the state of his mind by conversing with him on ordinary subjects, and can test his memory by asking about any business transactions which he may have been engaged in before he received the injury which brought him under your medical charge. While a wounded or poisoned person is giving an account of the deed of which he is the victim, his mind is very apt to become confused and wandering, and transactions which occurred at periods far removed from one another are often woven by him into one and the same story ; and if you have not previously tested his mental power, as I have told you, you may note down the chimerus of a brain incapable of attentive thinking, owing to a failure of its arterial circulation, as real occurrences which have befallen the individual at the time of his maltreatment. The power of recognizing and identifying persons remains longer than the power of giving a consistent and consecutive account of any occurrence ; but even this power becomes feeble or perverted after a time, and we should be careful, therefore, how we endeavour to obtain either declarations or identifications from dying persons when the thoughts and senses have become embarrassed by the advance of dissolution. We are all aware what endless litigations have arisen about the legality of wills made under the confusion of thought which is so common at the approach of death ; but these are trifles when compared with the sorrowful circumstances which have been occasioned by death-bed declarations and death-bed endeavours to establish identity, to substantiate criminal accusations " a fatal mistake of this kind was made some years since in London. A woman was maltreated by some men on Kensington Common :—She was taken to St. Thomas's Hospital ; and while dying from the effects of the violence, a suspected party was brought before her, as one of the supposed assailants. She deposed that he was one of those who had assaulted her. The man was tried, upon her declaration, respecting his identity,—found guilty and executed ; but a year after the execution, his innocence was satisfactorily established by the discovery of the real murderers !*

When you are at the bed-side of persons who is dying from the effects of weapons or poison used against him by another, you should allow his declaration, if he have any to make, to be purely voluntary ; and no

* Taylor's Medical Jurisprudence p. 197.

questions should be put to him but such as are necessary to give him an opportunity of clearing up any part of his statement, in which he may not have been sufficiently distinct and explanatory, to prevent subsequent doubt or uncertainty as to the meaning he desired to convey. The very words he utters ought to be noted down at the moment or, as furthest, immediately after he has done speaking on the subject; and these original notes should be preserved most carefully that you may be able to refer to them if the deposition have to be brought before a Court of Justice at any future period.

VIII. *In giving accounts of what you have seen, take care not to make mistakes. But, if you discover you have made a mistake in your evidence, lose not a moment in correcting your error before the Court.*—A good knowledge of your profession will go far to prevent you erring as to matters of fact, or in giving opinions upon the facts which have been brought to your notice. But if you inadvertently blunder in your statement, as even a well informed man may do, your duty will of course be to put yourself right before the Court the instant that the error dawns upon you. At the Chelmsford Assizes, March 14th, 1822, Dr. John Baddely gave it as his opinion that two drachms of copperas would produce death, but on his cross-examination he admitted he was confounding verdigris with copperas.* He had no false shame about his blunder, and so allowed it at once. He was only falling into the very common error, though not excusable on that account in evidence involving questions of life or death, of supposing that copperas must be a salt of copper, from its name, while in reality it is the vulgar name for sulphate iron. Dr. Rattray committed himself even more seriously on the trial of Capt. Donellan for the murder of Sir T. Boughton. He had sworn at the Coroner's Inquest that the deceased had been poisoned with arsenic; but he afterwards found good reasons for changing his opinion, and in his cross-examination on the trial he said "At that time (on the coroner's inquest) I did think he died of Arsenic; *but I am now clear that I was then mistaken.*" If you are so ignorant, however, as to entertain the Court with a tissue of blunders such as were perpetrated on the trial of Anne Barber for the murder of her husband by poison, York Assizes, 1821, by a medical witness, a Mr. T—H—, as he is obscurely and feeling-

* Smith's Medical evidence p. 248.

ly named by those who have pitied his ignorance, while they have felt compelled to quote his evidence as a warning to others, you will never be able to see your mistakes, and so never be able to correct them. "Mr. T—H—sworn, I am a Surgeon and Apothecary at O——, about a mile from the place where the deceased lived. On Saturday, March 17th, I was sent for to see the body: I went on Sunday morning, when the Inquest was sitting, and opened the body; I was able very clearly to ascertain the cause of death: I found the stomach in a very putrid state; the coats were very much corroded: it was very much inflamed indeed: the death I attributed to mineral poison: It is within my knowledge and experience that mineral poison would produce the effects I observed: from the coat of the stomach I took mineral poison: it was white arsenic: I proved it by a solution of ammoniated copper: tne solution is purple: on putting arsenic, it becomes quite *green*: nitrate of silver *does the same*; it is a very delicate test: I tried it by both, and found the same result: I know of no other substance but arsenic that does convert them into green: I am satisfied that it was arsenic: I opened the body further: the lungs were *very black, which I look upon as a criterion of mineral poison*: the external appearances were I saw the same in cases where it is known that arsenic was taken: on the bodyof the deceased there were various livid spots: the *skin* of *the stomach was quite green*, twice the breadth of a man's hand: I was satisfied from the appearance that he had died of mineral poison." And so it ever will be. Ignorance is always easily satisfied with explanations which it cannot understand.

You are more likely to produce erroneous impressions on the Court by want of being explicit and explanatory than by misrepresenting what you may have seen, or by giving a wrong opinion or a falseinference. You are more apt, in fact, to allow your evidence to fall short of the whole truth by your timidity in not entering minutely into particulars of description, and not giving a professional rationale of the occurrences or appearances, than of accidentally perverting the truth by a mistake in your observations. To avoid this error you should be willing to speak freely in reply to questions, and not require the evidence to be dragged out of you by a long series of petty questions by perseverance in which much information may in time be drawn from you, but at the end of which much that it may be very necessary for the Court to be informed of will remain unsaid by you—"medical students are advised

by teachers of great eminence to say no more than is necessary in answer to the questions put to them. The advice is excellent in one way, but I cannot admit the propriety on the principle by which it is dictated. For any witness to *babble* in a Court of Justice must be highly indecorous; for a man of science to do so on matters of opinion, would be ridiculous; but to adhere strictly to bare replies to questions, whatever they may be, lest a clever interrogator should lead the respondent into confusion and contradiction, is an injunction applicable, and in fact likely to be useful to those only who are altogether unqualified to undergo such an examination. It may be supposed to screen the witness from self commitment, and perhaps might prevent gross exposure of his ignorance; but, if uniformly observed, it could not but lead —sometimes to the implication of innocence, more frequently to the exculpation of the guilty, but almost always to an unfavorable impression as to the practitioners discharge of duty. If it appears to a professional witness that the questions put to him are not calculated to produce the real explanation belonging to the point at issue, he ought, of his own accord, to supply whatever may be essentially wanting. In his answers he is sworn not only to speak the truth, but the WHOLE TRUTH; and this he may do without incurring censure for untimely or indecorous officiousness; without improper interference with statements given on the part of other practitioners; and often with the gratifying result of preventing mistakes, by explanation, to which by bare replies, he might have contributed."*

IX. *Take care not to differ widely from other medical witnesses, unless there are strong grounds for doing so. In fact, do not differ merely out of pure combativeness, and merely for the pleasure of differing and showing your own opinions.*—Although well educated medical men cannot easily differ in their views of the principles of medicine and surgery, they may and do differ very considerably in their methods of following out those principles in practising their professions, and are liable to lose sight of the important fact that a principle may be carried out and the desired end, the relief or removal of disease, may be accomplished by what at first sight appear to be very different methods, and by medicines which seem to have very opposite actions. "I have shown" says Dr. Billing† "how every medi-

* Smith's Forensic Medicine p. 535.

† Principles of medicine 4th edition Advertisement p. 10.

cal man has his hobby to carry him to the same point, which, though he thinks it very different from his neighbour's, is as like it as one four-legged jade is to another; now one man thinks he has made a discovery that he can cure cholera* with sugar of lead, and that there is nothing equal to it; whilst tartar emetic, calomel epsom salts, or glauber salts, or common salt, or mustard, or lemonade, or vinegar and water, &c. &c., will do the same thing; though none of them more quickly carry off the vomiting and purging than two of these hobbies in double harness—than tartar emetic with some neutral salt, I care little which." From want of such consideration medical witnesses have not unfrequently impugned one another's conduct and prescriptions. On the trial of Robert Sawle Donnall Surgeon and apothecary for the wilful murder by poison (supposed to be arsenic) of his mother-in-law Mrs. E. Downing, at the Launceston Assize March 31, 1817, one of the Medical witnesses, believing in his simplicity that the only road to success in the treatment of a case was the one which he always followed, allowed himself to incur the censure of the Court by attempting to injure the Medical reputation of a witness who had preceded him in his evidence.

Mr. John Tucker (Examined by Mr. Serjeant Pell) you are a Surgeon living at Exeter.—I am. And a member of the Royal College of Surgeons? Yes, I am. You have heard the symptoms and circumstances first described by Dr. Edwards and Mr. Street? Yes.

From the different facts which both those gentlemen have spoken to, as to the state of the stomach of the deceased when opened, what disorder should you have supposed that person to have died of? From some inflammation in the stomach. What disorder in the human frame, in your judgment, would be likely to produce such appearances? Hernia, cholera morbus, and idiopathic inflammations or inflammations from unknown causes; that is, when we find those appearances of the stomach where we can assign no causes.

Now, supposing a person to have had violent retchings, and purgings, accompanied with a pain in the stomach, and accompanied with such appearances as these in the stomach; if the body had been opened, to what causes would you attribute it? To Cholera Morbus, if I had not detected Hernia.

* English cholera, I suppose, is meant here. A. B.

(*By Mr. Justice Abbott.*) You mean to say that if you had found the stomach in the state described by Dr. Edwards, you would ascribe that to Cholera Morbus? Yes, my Lord.

(By Mr. Serjeant Pell.) You have heard it stated in evidence what the plan was that Mr. Donnall pursued when he administered Medicine to Mrs. Downing that night? I have, Sir.

Was that the right or the wrong one? It was partly right and partly wrong.

In what respect was it right? In the exhibition of opium.

In what respect was it wrong? In giving anything that would increase the irritation that already existed.

Have you seen the prescription which Dr. Edwards wrote that night? No, I have not; but I would wish to see it (*here the prescription alluded to was shewn to the witness.*

Now supposing a person to have retchings and purgings for several hours, and that you found these attended with frequent and fluttering pulse, in that state of the illness what should you have prescribed? I should have prescribed diametrically opposite to the prescription of Dr. Edwards; I should consider that prescribed by Dr. Edwards as adding weight to a porter's back.

Mr. Justice Abbott (*to the witness.*) Don't speak metaphorically. You are speaking just now of a gentleman of experience and respectability. I don't wish you to conceal your opinion, but only to speak it in different language.

(*By Mr. Segt. Pell.*) You should have pursued a method diametrically opposite, you say; now what is the course pursued by that prescription? There was irritation already existing in the bowels, and that prescription, I conceive, would tend to increase that irritation.

Besides tending to increase the irritation, in your judgment, what other effect would be produced by it, in that state of the person? There was considerably debility or exhaustion, and I should think *that* would increase that debility and exhaustion.

What should you have given?

I should have supported the patient, and given opium in large doses.

Very different was the conduct of Abernethy when giving his opinion as to what had been the real cause of the death of a child which had been severely burned. He knew the principles of professional

practise thoroughly, and was ready with sound reasons on the real action of Medicines.—"A medical man was prosecuted for killing a child by giving it opium, at least that was said. I happened to be in the country at the time, and was strongly solicited by him to attend and give my opinion. I considered that the character of the profession was at stake; and, although rather against my inclination, I went. After waiting in a crowded Court the greatest part of the day, I was called upon and placed in the witness box. The lawyers had taken it into their heads that the child had died from maltreatment on the part of the surgeon; the child had been scalded severely, and he had given opium, and they thought they would be able to make the jury think as they did. The first question put to me was, "Mr. Abernethy, will you inform us what is considered the proper treatment for scalds?" This was a question broad enough to be sure; I was puzzled a little how to answer it; I did not know but that they would require a lecture on burns and scalds. I considered a minute, and then said, 'That which was adopted in the present case.' Oh! that was what they did not expect; it was giving a turn to the case which they did not like. 'You have heard the evidence, have you not?—yes, but it is contradictory.—But judging from the evidence? I have no right to judge; you may judge if you please, or the jury may judge, but I shall not.—But I ask you for the information of the jury, your opinion respecting the opium, whether you do not consider it too large a quantity for a child? The statements respecting the opium have been contradicted; but admitting that the child had, as was said, eight drops immediately after the accident, and ten drops two hours after, I should say that the child had not taken one drop too much. But are you aware that the child had no pain? Yes, perfectly; when the skin, or any other part of the body, is severely injured, the nervous system of the part is so affected that the peculiar actions of the nerves on the brain or spinal marrow, by which alone pain can be felt, do not take place. A man may have a serious injury inflicted by a mechanical cause, may have his leg smashed, and nearly torn off by machinery, and yet feel little or no pain; and we are in the habit of giving, in such cases, wine and opium, not to act as a narcotic, but to arouse the energies of the vital powers, and call them again into exercise: the nervous system has sustained a great shock from which it requires to be roused. The judge said that he understood it; he

saw the principle on which the treatment was founded, and had no doubt but it was correct. 'But,' my lord, 'said the counsel, 'the child slept to death'. So he may have appeared to sleep, but he would have done so if no opium had been given ; it was the torpid state into which the nervous system had fallen which caused that appearance, and from which the child could not be roused. Here the business rested ; the treatment was admitted to be correct, and the character of the gentleman exculpated.*

X. *Remember that the Court can reject any part, or even the whole of your evidence.*—The most remarkable recorded instance in which Medical evidence (testimony it should rather be denominated as the sequel will show) has been virtually set aside is that of the celebrated John Hunter on the trial of Captain Donellan for the murder of Sir Theodosius Boughton, Baronet, by administering Laurel water to him on the 30th August, 1780. It is altogether a most instructive case and ought to impress upon us the necessity of preparing ourselves in every possible way, by a good general knowledge of Medical jurisprudence and by special study of all the Medical features of any criminal proceeding on which we may be called upon to give our opinions. Mr. Hunter afterwards regretted the appearance which he made on this trial, and used to express his regret publicly in his lectures that he had not given more attention to the subject before he ventured to give an opinion in a Court of Justice. The inquest was held on the 12th September 1780 and continued till the 14th November. The trial did not take place till the 30th March 1781 so that there were fully six months for experiments on and enquires into the kind of poisoning in question. It came out during the trial that Mr. Hunter was consulted soon after the Inquest. Suspicions have been expressed from time to time that he either had from the first so strong a persuasion of Donellan's innocence, or was so friendly to him, that he had resolved if possible to assist him, and for this purpose took the only course at all consistent with integrity† that of wilfully not making such preparation as would alone enable him to give any decided or receivable opinion on the subject. A strict integrity, however, would lead a witness to do his best to vindicate the law even with the bitter prospect of sacrificing his friend.

" *Mr. John Hunter sworn.*—1. Have you heard the evidence that has been given by these gentlemen ? I have been present the whole time.—2. Did you

* Lancet vol. 6, p. 229.

† Smith on medical evidence p. 187.

hear *Lady Boughton's* evidence? I heard the whole.—3. Did you attend to the symptoms her ladyship described as appearing upon *Sir Theodosius Boughton*, after the medicine was given him? I did.—4. Can any certain inference, upon physical or chirurgical principles, be drawn from those symptoms, or from the appearance externally or internally of the body, to enable you, in your judgment, to decide that the death was occasioned by poison? I was in London then; and a gentleman who is in Court waited upon me with a copy of the examination of *Mr. Powell* and *Lady Boughton*, and an account of the dissection, and the physical gentlemen's opinion upon that dissection.—5. I don't wish to go into that, I put my question in a general way? The whole appearances upon the dissection explain nothing but putrefaction.—6. You have long been in the habit of dissecting human subjects? I presume that you have dissected more than any man in Europe? I have dissected some thousands during these thirty-three years.—7. Are those appearances you have heard described, such, in your judgment, as are the result of putrefaction in dead subjects? Entirely.—8. Are the symptoms that appeared after the medicine was given, such as necessarily conclude that the person had taken poison? Certainly not.—9. If an apoplexy had come on, would not the symptoms have been nearly or somewhat similar? Very much the same.—10. Have you ever known or heard of a young subject dying of an apoplectic or epileptic fit? Certainly; but with regard to the apoplexy, not so frequent, young subjects will perhaps die more frequently of epilepsies than old ones; children are dying every day from teething, which is a species of epilepsy arising from an irritation.—11. Did you ever, in your practice, know an instance of laurel-water being given to the human subject? *No never.*—12. Is any certain analogy to be drawn from the effects of any given species of poison upon an animal of the brute creation, to that it may have upon a human subject? As far as my experience goes, which is not a very confined one, because I have poisoned some thousands of animals, they are very nearly the same; opium, for instance, will poison a dog similar to a man, arsenic will have very near the same effect upon a dog, as it would have, I take for granted, upon a man; I know something of the effects of them, and I believe their operations will be nearly similar—13. Are there not many things which will kill animals almost instantaneously, that will have no detrimental or noxious effect upon a human subject; spirits for instance occur to me? I apprehend a great deal depends upon the mode of experiment; no man is fit to make one, but those who have made many, and paid considerable attention to all the circumstances that relate to experiments. It is a common experiment, which I believe seldom fails, and it is in the mouth of every body, that a little brandy will kill a cat. I have made the experiment, have killed several cats, but it is a false experiment; in all those cases where it kills the cat, it kills the cat by getting into her lungs, not into her stomach; because if you convey the same quantity of brandy, or three times as much, into the stomach, in such a way as the lungs shall not be affected, the cat will not die; now, in those experiments that are made in forcing an animal to drink, there are two operations going on; one is a refusing the liquor by the animal, its kicking and working with its throat to refuse it; the other is the forcing the liquor upon the animal; and there are very few operations of that kind, but some of the liquor gets into the lungs; I have known it from experience,—14. If you had been called upon to dissect a body suspected to have died of poison, should you not have thought it necessary to have pursued your search through the guts? Certainly,—15. Do you not apprehend that you would have been more likely to receive information from thence than any other part of the human frame? That is the track of poison, and I should certainly have followed that track through. 16. You have heard of the froth issuing from *Sir Theodosius's mouth* a minute or two before he

died : is that peculiar to a man dying of poison, or is it not common in many other complaints? I fancy it is a general effect of people dying in what you may call health, in an apoplexy, or epilepsy; in all sudden deaths, where the person was a moment before that, in perfect health.—17. Have you ever had an opportunity of seeing such appearances upon such subjects? Hundreds of times.—18. Should you consider yourself bound, by such an appearance, to impute the death of the subject to poison? No, certainly not; I should rather suspect an apoplexy, and I wish in this case, the head had been opened. Do you apprehend all doubts would have been removed? it would have been still farther removed, because, although the body was putrid, so that one could not tell whether it was a recent inflammation, yet an apoplexy arises from an extravasation of blood in the brain, which would have laid in a coagulum. I apprehend, though the body was putrid, that could have been more visible than the effect any poison could have had upon the stomach or intestines.—20. Then, in your judgment, upon the appearances the gentlemen have described, no inference can be drawn from thence that *Sir Theodosius Boughton* died of poison? Certainly not, it does not give the least suspicion.

("Cross examined by *Mr. Howorth.*) 21. Having heard the account to-day, that *Sir Theodosius Boughton*, apparently in perfect health, had swallowed a draught which produced the symptoms described, I ask you, whether any reasonable man can entertain a doubt that that draught, whatever it was, produced those appearances? I don't know well what answer to make to that question.—22. Having heard the account given of the health of this young gentleman on that morning, previous to taking the draught, and the symptoms that were produced immediately upon taking the draught, I ask your opinion, as a man of judgment, whether you don't think that draught was the occasion of his death? With regard to his being in health, explains nothing; we frequently, and indeed generally, see the healthiest people dying suddenly, therefore I shall lay little stress upon that: as to the circumstances of the draught, I own they are suspicious; every man is as good a judge as I am.—*Court.* You are to give your own opinion upon the symptoms only, not upon any other evidence given—23. *Mr. Howorth.*—Upon the symptoms immediately produced, after the swallowing of that draught, I ask whether in your judgment and opinion, that draught did not occasion his death? I can only say, that it is a circumstance in favour of such an opinion.—24. *Court.* That the draught was the occasion of his death? No; because the symptoms afterwards are those of a man dying, who was before in perfect health; a man dying of an epilepsy or apoplexy; the symptoms would give me those general ideas.—25. It is the general idea you are asked about now, from the symptoms which appeared upon *Sir Theodosius Boughton* immediately after he took the draught, followed by his death so very soon after; whether, on that part of the case, you are of opinion that the draught was the occasion of his death? If I knew the draught was poison, I should say most probably that the symptoms rose from that; but when I don't know that that draught was poison, when I consider that a number of other things might occasion his death, I cannot answer positively to it.—26. You recollect the circumstance that was mentioned of a violent heaving in the stomach? All that is the effect of the voluntary action being lost, and nothing going on but the involuntary.—27. *Mr. Howorth.* Then you decline giving any opinion upon the subject? I don't form any opinion to myself, I cannot form an opinion; I can conceive, if he had taken a draught of poison, it arose from that; I can conceive it might arise from other causes.—28. If you are at all acquainted with the effects and operation of distilled laurel-water, whether the having swallowed the draught of that, would not have produced the symptoms described? I should suppose it would; I can only say this, of the experiments I have made of laurel-water upon animals, it has not been

near so quick; I have injected laurel-water directly into the blood of dogs, and they have not died; I have thrown laurel water, with a precaution, into the stomach, and it never produced so quick an effect with me as described by those gentlemen.—29. But you admit that laurel-water would have produced symptoms such as have been described? I can conceive it might.—30. *Mr. Newnham.* Would not an apoplexy or an epilepsy, if it had seized *Sir Theodosius Boughton* at this time, though he had taken no physic at all, have produced similar symptoms too? Certainly.—31. Where the father has died of an apoplexy, is not that understood, in some measure, to be constitutional, and that can be given to a child. There is no disease which is acquired, that may not be given to a child; but whatever is constitutional in the father, the father has a power of giving that to the children; there is no such thing as an hereditary disease, but there is an hereditary disposition for a disease.—32. *Mr. Howorth.* Do you call apoplexy constitutional? We see most diseases are constitutional; the small-pox is constitutional, though it requires an immediate cause to produce the effects. The venereal disease is hereditary. I conceive apoplexy as much constitutional as any disease whatever.—33. Is apoplexy likely to attack a thin young man who had been in a course of taking cooling medicines before? Not so likely, surely, as another man; but I have, in my account of dissections, two young women dying of appoplexies.—24. But in such an habit of body, particularly attended with the circumstance of having taken cooling medicines, it was very unlikely to happen? I do not know the nature of medicine so well as to know that it would hinder an appoplexy from taking an effect.—35. *Court.* Give me your opinion, in the best manner you can, one way or the other, whether, upon the whole of the symptoms described, the death proceeded from that medicine, or any other cause? I do not mean to equivocate, but when I tell the sentiments of my own mind, what I feel at the time, I can give nothing decisive.

"I shall now, Dr. Smith says,* add the remaining part of the commentary which I have ventured to insert upon this important passage in medico-legal history, and which relates entirely to the course of examination pursued with Mr. Hunter.

"Had he been allowed to proceed with the intended answer 4, something would perhaps have come out that would have given a different turn to the whole affair. A simple query from *Mr. Howorth*, as to the special use *Mr. Hunter* had made of the information communicated at that time, would have brought out something probably worth knowing. The answer to 10 is nothing to the purpose. Apoplexy is not the disease of young men nearly twenty-one; and the nature of epilepsy does not favour the supposition of a person going off in *the first* fit of that disease at such a period of life. Answer 13 is mere byeplay; and though 14 may appear very pertinent, such an examination, however desirable to have been made, when the issue undergoes a mystification on account of its neglect, is not universally necessary, particularly in cases of vegetable poisoning, such as that in question. The answer to 18 is specious enough; but if the head had been opened, and congestion had been found, would Mr. Hunter have maintained that such an appearance discountenanced the supposition of death by narcotic poison? As to coagula (19), the statement that extravasation must have taken place in apoplexy, was (to say the least of it) loose on the part of such an authority. The answer to 22 is decidedly favourable to the evidence on behalf of the crown. Contrast it with that of 20—it savours of contradiction. With regard to question 23, put by the counsel for the

* Smith on medical evidence, p. 266.

crown, and 24, put, (for the more certain understanding of the other) by the judge, is there not a flat contradiction in the answers, followed by an unintelligibly constructed sentence in place of an explanation? At 24, he seems inclined to evade, by an incomprehensible allusion to the symptoms of persons dying in perfect health; as if there were established symptoms of that nature: if the words are correctly taken down, what do they mean? Have they any meaning at all? At 25 he says, "If I knew"—here he must mean of his own knowledge, from having made the draught up himself, for he discredits the crown witness if he did *not* know. As to 26, I ask whether narcotic poisons, do *not* suppress voluntary actions? What does he say to 27? He extinguishes his own torch completely. 28 is merely waiving the question, and to 29 he says fully as much against the prisoner as any thing uttered by him in the course of the examination, or his whole evidence taken together, could possibly be construed to make in his favour. And when at last urged for an opinion of any sort, either way, (35), what does it all come to? "I can give nothing decisive."

"Now, whether the unfortunate prisoner suffered wrongfully or not, I will not take upon me to infer; but I cannot help thinking, that the evidence of the only professional witness brought forward on his behalf, should go for very little, and that, as the ground for forming an opinion, it is not at all to be entertained, when contrasted with that adduced on the part of the prosecution."

"I doubt whether there are not on record very evident examples of witnesses maintaining ignorance, and going forward in a state of *premeditated incapacity* to clear up a dubious point. In some of these suspected cases, whatever the motive may have been, it was manifestly in the power of the party to have acquired fuller knowledge, and to have approached nearer the utterance of the whole truth; in other instances, perhaps, the ignorance may have been equally premeditated, although the means of avoiding it may not have been so much at command. In some of these latter cases, men have indulged in round assertions as to the *inutility* of making certain investigations, when the real cause of their omission must have been their own inability, or, at the best, disinclination to perform them."

In charging the Jury, Mr. Justice Buller said "For the prisoner, you have had one gentleman called, who is likewise of the faculty, and a very able man. I can hardly say what his opinion is, for he does not seem to have formed any opinion at all of the matter. He at first said he could not form an opinion whether the death was, or was not, occasioned by the poison, because he could conceive that it might be ascribed to other causes. I wished very much to have got a direct answer from Mr. Hunter, if I could, what upon the whole, was now the result of his attention and application to the subject; but he says he can say nothing decisive; so that, upon this point, if you are to determine upon the evidence of the gentlemen who are skilled in the faculty only, you have the *very positive* opinion of four or five gentlemen of the faculty that the deceased did die of poison. On the other side, you have what I really cannot myself call more than the *doubt* of another; for it is agreed by Mr. Hunter, that the Laurel Water would produce the symptoms which were described. He says an Epilepsy or Apoplexy would produce the same symptoms; but, as to an Apoplexy, it is not likely to attack so young and so thin a man as Sir Theodosius was: and, as to an Epilepsy, the other witnesses tell they dont think the symptoms, which have been spoken of, do shew that Sir Theodosius had any Epilepsy at the time."

PART FOURTH.

SELECTIONS.

LECTURES ON DIGESTION, RESPIRATION, AND SECRETION,

GIVEN AT THE ROYAL INSTITUTION,

TO THE MEMBERS AND TO THE PUPILS OF ST. GEORGE'S HOSPITAL.

BY H. BENCE JONES, M. D., F. R. S.,
Physician to St. George's Hospital.

[Continued from page 306.]

ON THE CHANGES WHICH NITROGENOUS ORGANIC SUBSTANCES CAN UNDERGO OUT OF THE BODY.

I have shown you, gentlemen, that many animals, as long as they are without mechanical means of dividing their food, finding in milk the substances of which each of the different parts of their body is composed; and these substances exist in the milk in a state most capable of being finely divided by the chemical action which takes place in the body. The same animals, as soon as they are furnished with teeth, directly or indirectly obtain the same four classes of substances from grass or from corn which, by mechanical as well as by chemical action, they are then able to subdivide. Taking now these classes of substances that exist in food separately, I purpose bringing before you the chemical changes which they can undergo by means of the action of reagents out of the body; the changes which take place by the action of agents within the body can only thus be understood. I shall, in this lecture take the nitrogenous class, and I shall show you some of the changes which the substances composing it can undergo out of the body, more particularly insisting on those changes which promote the fine division of the nitrogenous part of our food. In other words, the solution out of

the body of the nitrogenous substances will form one subject of this lecture. But nitrogenous bodies not only pass into the body ; but, after having served the purposes of life, again pass out of it ; I shall, therefore, occupy your attention with those further changes which can be effected in the nitrogenous or albuminous compounds, in order that you may be able to understand the different forms in which this class of substances may ultimately be rejected from the body.

I will commence this lecture with a few words on the means of recognising this large class of substances. The mode by which you may recognise their presence I showed you on my lecture on grass. You may remember the action of caustic potash, or of caustic lime, with caustic soda upon grass, and that by means of these substances ammonia was evolved in plenty. This is a simple mode, by which we may show the presence of the nitrogen in the compound belonging to this class of substances, whether they be derived from the vegetable or from the animal kingdom. If a nitrogenous substance—the white of an egg for example—is treated with caustic potash, it gives off nitrogen in plenty as ammonia. But it does more. Most nitrogenous food not only contains nitrogen as a constituent, but sulphur also, which can be detected after the substance has been subjected to heat with caustic potash, or caustic soda. If I take this albumen, and heat it with very strong caustic potash, I get ammonia evolved in plenty, and sulphur is distinctly separated from the other elements. The test for discovering the presence of the sulphur is a very simple one. If I dilute with a little water a portion of the liquid that has been heated with caustic potash, then if there is sulphuret of potassium present, on the addition of a drop of acetate of lead, I shall have sulphuret of lead precipitated as a black deposit. You see it here. There is another very beautiful test for these albuminous compounds which I may also show you. If a portion of the white of an egg is taken, (I use this because it is the most convenient ; any other albuminous compound would answer the purpose,) and is heated with very strong hydrochloric acid, a very beautiful reaction ensues. In the former experiment I might have asked you to observe, that very strong caustic potash not only acts upon the albumen in slightly decomposing it, but that it dissolves the albuminous substance. So, in the experiment I am about to show you the hydrochloric acid has not only the power of slightly decomposing the

albumen, but also of dissolving it, forming a distinct deep blue solution. Strong acids, then, and strong alkalies, dissolve albuminous substance without difficulty. The hydrochloric acid and the albumen being mixed, and then boiled, a remarkable change takes place. The edges assume a distinct pink colour, and in a few moments the albumen is dissolved; the liquid then becomes of an intense purple colour, and, on applying heat a little longer, an intense blue; after standing some time, it again assumes its former pink or claret colour. This is another reaction by which you can detect the presence of albuminous substances. I have shown you that these substances are soluble in strong alkalies and strong acids. This I shall have occasion to apply hereafter. I must also show you another beautiful test for albuminous substances. I have here the white of an egg dissolved in a little water. The fluid is acidulated by acetic acid; and then, on the addition of a drop of the ferro-prussiate of potash, if an albuminous substance is present, there will be a plentiful precipitate. A more delicate test still, by which a very small quantity of albumen can be detected, is that of adding sulphate of copper and liquor potassæ, which produce an intensely purple colour with albumen. This reaction is similar in appearance to that produced by the hydrochloric acid, but it differs from it altogether in other respects.

Such are some of the reactions by which the presence of the nitrogenous class of bodies can be detected. If any of these nitrogenous bodies are oxidized, or burned, as far as possible very nearly the same products of combustion are obtained. The elements of these substances, when fully oxidized, give nearly the same results. Sulphur, when fully oxidized, becomes sulphuric acid; and phosphorus when burned to the furthest degree, becomes phosphoric acid. Thus carbonic acid, sulphuric acid, phosphoric acid, and water, are the oxidized products of the combustion of these albuminous substances. You will remember that I brought before you, in my first lecture, carbonic acid, ammonia, water, sulphuric acid, and phosphoric acid, with the earth and alkalies, as constituting the food of plants; in fact, it is out of these substances that the albuminous substances are formed in plants, and therefore it is that they are re-produced when oxidation takes place If grass or wheat is fully oxidized, the combustion furnishes the food of plants; and what is true of the whole plant is true of these albuminous and non-albuminous constituents. So also regarding the albuminous and non-albuminous substances existing in flesh and in milk; if fully oxidiz-

ed, they give carbonic acid, ammonia, water, sulphuric acid, and phosphoric acid; and if there be a quantity of ash present, this also is given back in a high state of oxidation. The use I shall make of this will not appear until a late lecture; it is snfficient for me here to point out the fact as it actually occurs.

Thus, then, by combustion, you derive a knowledge not only of the composition of the albuminous substances; but you learn also the substances which may possibly be formed within the body by the furthest possible changes which can take place in those albuminous substances of which the body is composed. Before considering these ultimate changes, it would be well, first, to consider how these substances pass into the body, and what are the slightest changes which take place in them for that purpose. If albuminous substances, when very finely divided, are treated by acids, and more particularly by hydrochloric acid, or acetic acid, after some hours a partial solution is effected, very different, however, from the solution which takes place in the stomach. I have before me some eggs which were reduced, this morning, to the finest possible state of subdivision, by being rubbed in a mortar; very weak hydrochloric acid (but stronger than that in the stomach) was added, and the eggs were then placed on a sand-bath at the temperature of 96°, and were not removed till half an hour ago. You will observe that the digestion, so to speak, is very far from being complete, by the means of acid alone, still some portion is dissolved; and you may remember that in my lecture on flesh I pointed out that flesh-fibre is more soluble in hydrochloric acid than the fibrine of the blood. It has been said that albuminous substances are dissolved, if treated with saline solutions; and it is said that common salt assists digestion. It does not assist the solution of the albuminous substances; on the contrary, if they have been hardened by being placed in salt, they are rendered more difficult of solution. A very interesting observation has been made, that venous fibrine of blood is soluble in nitrate of potash, while arterial fibrine is not, This is one means by which the two kinds of fibrine may be distinguished. This is not a fact which applies to the theory of digestion, but it is an interesting fact in itself, and worthy of being brought before you. Venous fibrine in this flask is partially dissolved in a solution of nitrate of potash, and it can be detected by the means I have shown you. It can be precipitated by heat and acids, and

will exhibit those beautiful colours which you have seen, by the hydrochloric acid, or by sulphate of copper and liquor potassæ.

As regards the action of mineral acids, it is not improbable that they effect some slight change in the composition of albuminous substances in dissolving them; but we have no certain knowledge on this subject. When these albuminous substances are treated continuously with caustic alkalies, they undergo slight changes—the changes which I have already shown you. The greater part of the phosphorus and sulphur is removed; and it was thought by Professor Mulder, of Utrecht, that all these albuminous substances, when treated with caustic potash, gave the same results.

Albumen dissolved in caustic alkali, as you have seen, is precipitated by acetic acid, and this precipitate, Professor Mulder thought, was always the same, whatever was the source of the albuminous substances. He considered that the precipitate consisted of a substance which contained all the elements which compose the albuminous substances, with the exception of the sulphur and the phosphorus. These being absent he called the new substance protein, because he thought it formed the different albuminous substances simply by the addition of different quantities of sulphur and phosphorus. This was a beautiful theory,—a beautiful means of retaining the composition of these substances in the mind; nothing could be simpler, they all consisted of protein as a definite principle, with variable quantities of sulphur and phosphorus. Such were the facts he attempted to establish by analysis; but late observations have not confirmed his theory; on the contrary, it is found that you may treat albumen as long as you please with caustic potash, and you never can separate all the sulphur from it; there is always a certain quantity of sulphur present with the protein, which cannot be separated by any chemical action whatever. When Professor Mulder found out that this was the fact, which Professor Liebig pointed out, and not in the gentlest way, Professor Mulder made an addition to his theory—he stated that part of the sulphur existed in a different state, not entering into the constitution of the protein, but being combined with it, not as compounds of sulphur and phosphorus with the elements of protein, but as more complex compounds of sulphuramide and phosphoramide with protein. I may remind you that an amide contains one equivalent of hydrogen less than ammonia. He assumed that part of the sulphur and phosphorus was present, not in the protein itself, but as

additional combinations with the organic elements which constituted protein. This may be a very pretty way of trying to explain this fact, but we do not know of any such amides existing. That such a substance as protein, free from all sulphur, exists, Professor Liebig denies, and those who have worked most on this subject agree with him. Still, we may take this fact as arising out of these beautiful—for they were beautiful investigations of Professor Mulder, that all these bodies are very closely related to one another. We may conclude, also, that the use of the word protein had better been given up, as it implies a theory not based on fact. Instead of speaking of these bodies as protein compounds, you will find that I shall term them albuminous bodies. Here is Professor Mulder's complex formula for albumen, and the supposed formula for protein :—

Albumen 20 $(C_{36}\,H_{25}\,N_4\,O_{10} + 2\,H\,O) + H_2\,N\,S + H_2\,N\,P$,
Protein . . $C_{36}\,H_{25}\,N_4\,O_{10} + 2\,H\,O$

It is difficult to name any of these uncrystallizable substances, of which the definite composition can be accurately determined. It is tolerably easy to obtain the proportion of the elements,—the proportion of the bricks and mortar in the house,—but the actual quantity constituting the organic element or the equivalent of albumen for example can scarcely be determined. Being uncrystallizable, it cannot be obtained in a state which renders it most fitted for the determination of the equivalent, or combining number,—the number of atoms congregated together to form one atom of the albuminous principle. Though a substance free from sulphur cannot be obtained, yet the action which Mulder showed that caustic potash has on albumen is a very important one, because we see in it one of the first changes which the albuminous substances can undergo ; and we, at least, learn the close relationship which subsists between the different substances which compose this class of compounds. If, instead of a moderately strong solution of alkali, I use strong potassa fusa, and fuse with it the powdered white of an egg, for instance, to the last degree, as long as any ammonia is given off, I get a very different substance from that which would be obtained from treating it with dilute solution of caustic potash. The action is more energetic and destructive. (Experiment.) If I take albumen, fibrine, or casein, and when they are dried mix them with an equal weight of hydrate of potash, and fuse them until hy-

drogen begins to escape with the ammonia, or until the dark brown colour which was at first present changes to yellow, I get, when the fused mass is dissolved in warm water, and supersaturated with acetic acid, a beautiful substance precipitated, of which I am enabled to show you through the kindness of Professor Liebig. It is a crystalline body, known by the name of *Tyrosin*. It is also found that, when this body has been separated by acetic acid from the mother liquor, another substance crystallizes out and may be purified by re-crystallization from alcohol. It is known by the name of *leucin;* and here is a specimen of it. The relation of these substances is best seen by their formulæ.

Tyrosin . .	C_{16}	H_9	N	O_5
Leucin . .	C_{12}	H_3	N	O_4

The leucin forms more readily by fusion than the tyrosin; for, if the fusion is stopped too soon, leucin only is formed. The tyrosin appears to be formed by further action on the leucin. I point out this re-action to show you how crystalline bodies, containing carbon, hydrogen, oxygen, and nitrogen, can be obtained from albuminous substances by actions out of the body, by caustic potash, by oxidising actions, &c. Though these substances are not identical with those crystalline substances which are formed in the human body, namely uric acid and urea, yet they bear a distant relation to them; and the relation is at any rate worth noting, because the artificial production of uric acid or urea from albumen out of the body is much to be desired. If one of these bodies, leucin, is melted with fused potash, *valerianate of potash*, with carbonic acid, hydrogen, and ammonia, are formed.

Leucin + Potash. = Carb. Potash Ammon. Hydrogen + Valerianate of Potash.

$$C_{12}H_{13}NO_4 + 3KO + 3HO = \begin{cases} 2CO_2 & KO & NH_3 & 4H \\ + & \text{Valerianate of Potash.} & & \\ C_{10} & H_9 & O_3 & KO \end{cases}$$

This valerianic acid can be formed directly from albumen without passing through the stage of leucin or tyrosin. But you will say, no action can take place in the body similar to these energetic actions of caustic potash. But this is not the fact: the action of decomposition is precisely similar to the action of caustic potash. If a pure solution of leucin is mixed with a little flesh water, or with albumen or casein, and left to decompose, the change represented above occurs. If a solution of casein, perfectly free from fatty matter, is left to decompose

to undergo slow changes by the slow action of the air and putrefaction, it gives off first carbonate and hydrosulphuret of ammonia; afterwards between the second and fifth month, ammonia, valerianic acid, butyric acid, and leucin; also an acid which gives tyrosin and ammonia. So, also, if I take fibrine, and leave it to be decomposed in the air, if water is present it becomes dissolved; it becomes coagulable by heat, it attracts oxygen, gives off gradually ammonia, carbonic acid, butyric acid, and sulphuretted hydrogen, and leaves leucin and tyrosin by the simple action of decomposition, without any stronger agent than the mere molecular changes which take place in putrefaction. If, instead of taking caustic potash, I take oxydising agents,—if I take, for instance, chromic acid, or peroxide of manganese and sulphuric acid, which give up oxygen easily, most beautiful results can be obtained. It is found, if albumen is thus treated, it gives rise to acetic acid, benzoic acid, bitter almond oil, butyric acid, and valerianic acid. Fibrine gives rise also to acetic acid and benzoic acid rather less in quantity than albumen, and more butyric acid than any other albuminous compound of which I have spoken. Casein gives more acetic acid, benzoic acid, and bitter almond oil, than fibrine; but less valerianic and butyric acids. It more nearly resembles albumen in the production of its decomposition than fibrine. All the vegetable albuminous bodies, when oxidised by chromic acid, or by peroxide of manganese and sulphuric acid, give similar results.

Thus much regarding the changes which take place out of the body, on these albuminous substances. But there is one other substance, of which I must mention the changes which can be effected upon it out of the body, in order that you may understand the changes which take place in the body—*isinglass*, or gelatine. If this body is burned, it gives carbon, oxygen, hydrogen, nitrogen; but no sulphur or phosphorus.

Gelatine.

C	500					
H	65					
O	251	=	C_{13}	H_{10}	O_5	N_2
N	184					
	1000					

Protein with oxygen contains the same elements as gelatine, ammonia, carbonic acid, and water. If I take Professor Liebig's formula for

protein, the relation of protein to gelatine may be represented thus :—

Formation of Gelatine.

Protein C_{40} H_{31} N_5 O_{12} + O_{34}	2 Gelatine	C_{26}	H_{20}	N_4	O_{10}
	Ammonia		H_3	N	
	14 Carb. acid	C_{14}			O_{28}
	8 Water		H_8		O_8
		C_{40}	H_{31}	N_5	O_{46}

If this gelatine is long boiled with caustic potash, as long as ammonia escapes, the result is the formation of glycocol, or sugar of gelatine and leucin. The alkaline fluid is neutralised by sulphuric acid, evaporated to dryness, dissolved in alcohol, and this beautiful substance, named *glycocol*, crystallizes out. It is a far simpler body than the gelatine out of which it was formed. The relation of glycocol to the processes which take place in the body I shall have full occasion to dwell upon in my lecture on the bile. I may mention here, that the substance known as hippuric acid may be obtained from the urine, by giving a man benzoic acid ; this benzoic acid undergoes a change in the body, and passes out as hippuric acid. This change was first detected by Mr. Ure. If, out of the body, I take one part of hippuric acid, and boil it for half an hour with four parts of strong hydrochloric acid,—a simple experiment,—we find that it divides into benzoic acid and glycocol, and, on the addition of water, benzoic acid is precipitated, the filtered fluid is evaporated to dryness, the hydrochlorate of glycocol is decomposed by caustic ammonia, and the glycocol is precipitated by absolute alcohol ; thus I can get this glycocol, or gelatine of sugar, out of hippuric acid in any quantity I please.

Hippuric acid = Benzoic acid + Glycocol.

C_{18} H_8 NO_5 HO = C_{14} H_5 O_2 + O + C_4 H_4 N O_3

In evaporating horse urine, if the temperature is too high, you get no trace whatever of hippuric acid, but you get benzoic acid in plenty, and you will then find that gelatine sugar is present also. The reverse occurs within the body ; the benzoic acid somewhere within finds the glycocol, and these combine and pass out as hippuric acid. This is a most important fact, and you will see the value of it when I speak of glycocol as existing in the bile. If the gelatine is oxidised by chromic acid or by peroxide of manganese, it gives nearly the same products as

are given in the case of albumen or fibrine, less benzoic and acetic acid, and oil of bitter almond, but more valerianic acid than fibrine gives when treated in the same way.

In concluding these instances of changes occurring in the albuminous substances by actions taking place out of the body, I will take the action of synaptase on amygdalin, because it will illustrate what I have to say in a future lecture. *Synaptase* is a yellowish-white, opaque, brittle mass, very soluble in water, and coagulable, like albumen, by heat. It rapidly putrefies. It exists in the emulsion of sweet almonds, and may be considered as vegetable albumen. *Amygdalin* is a substance procured from bitter almonds by boiling alchol. The amygdalin is a nitrogenous body—

Amygdalin.

			Liebig and Wohler.
Nitrogen ...	1	14	3·10
Carbon ...	40	240	52·50
Hydrogen ...	27	27	45·99
Oxygen ...	22	176	38·41
	1	457	100·00

and has no smell at all. If I take a sweet almond and beat it up in a mortar so as to make an emulsion of it, and then rub it until it is finely divided, and afterwards mix a little of this amygdalin with it, I shall have a perceptible change taking place,— a decided action of the albuminous substance on the amygdalin. I will dwell for a few moments upon this action; for, if I can make it plain to you, you will far more readily understand what I have to say on the digestive principles. I have here some of this amygdalin, having, as I said, no smell whatever, and I mix it with emulsion or synaptase, which also possesses no smell of the bitter-almond oil. If they are boiled separately, no smell of the bitter-almond will be perceived from either; but, if I boil them together, an action ensues, and almost immediately the odour of bitter-almond oil is developed in a considerable quantity; and not only so, but other substances are formed by the change that the emulsion or synaptase produces upon the amygdalin.

Amygdalin converted by Contact of emulsion and Water into

	Nitrogen.	Carbon.	Hydrogen.	Oxygen.
1. Hydrocyanic acid	1	2	1	...
2. Bitter-almond oil ...	...	28	12	4
1. Sugar	...	6	7	4
2. Formic acid ...	...	4	2	6
5. Water	...	...	5	5
Amygdalin =	1	40	27	22

All the substances mentioned in the diagram I could detect, and show you that they were actually present, if time permitted. For example, if I carry this experiment a little further, I may get prussic acid. The mode of examination for prussic acid is this:—The vapour obtained by distillation is dissolved in water and a drop of proto-salt of iron is added, with a little caustic potash. The whole is agitated in the air for a few moments, after which, by the addition of hydrochloric acid, the excess of iron, that is precipitated is dissolved, and a beautiful Prussian blue is produced.

Thus I have brought before you instances of the changes which can be produced in the most highly complex compounds out of the body by chemical actions. In every instance simple bodies are formed out of the more complex compounds. In the formation of protein, we see the first decided and least advanced change. In the action of stronger alkalies, or by decomposition, we see many more simple bodies formed out of the complex albumen—carbonate of ammonia, hydrosulphate of ammonia, valerianic acid, butyric acid, leucin and tyrosin. By partial oxidation we get simpler bodies still,—acetic acid, benzoic acid, bitter almond oil, butyric acid, valerianic acid. By extreme oxidation we get the simplest bodies, carbonic acid, ammonia, water sulphuric and phosphoric acids. In my next lecture I shall show you some changes which can take place in the non-nitrogenous organic substances by the action of the same agents out of the body.—*Medical Times, May* 3, 1851.

(*To be continued.*)

ON THE PHYSICAL DIAGNOSIS OF DISEASES OF THE ABDOMEN.

By Edward Ballard, M. D.
Late Physician to the St. Pancras Royal General Dispensary, &c.

(Continued from page 315.)

Auscultation.—*Mode of auscultation—Results of auscultation in health—Physical signs derived from auscultation in disease peritoneum, stomach, intestines, &c.—circulating system, &c.*

Auscultation.

The method of physical exploration which has been last considered was that which arises out of the phenomena of sound, as elicited by striking the surface of the abdomen, and as heard through the intermediate layers of air. The same sense informs us of varieties in the sound produced by the same means when the ear is applied either immediately or with the assistance of an appropriate conducting medium to the wall of the abdomen. The ear thus applied becomes cognizant also of other sounds, which other modes of manipulation, by imparting motion, may give rise to, or which originate spontaneously from the respiratory acts, or from the motions naturally occurring in the digestive tube, or in the circulating system of vessels. The appreciation of the sounds under all these circumstances is understood as that by "auscultation." Its application to diseased conditions of the abdomen at present is, indeed, but limited, compared with that which obtains in respect to thoracic maladies; but there is reason to believe that its more extended employment will lead to greater reliance in its diagnostic value.

Mode of Auscultation.

The position of the patient must vary with the part which is the object of exploration. When it is the anterior regions he may be recumbent, and when one side is to be examined he may turn over, so as to lie on the opposite. When the back is to be examined he may either stand, or sit up in bed, or upon a chair. The observer must suit his position to his convenience. The part to be examined should either be bare, or covered with some light article of clothing which emits no sound on pressure. The ear may be applied to the surface with only

this intervention, but more commonly the stethoscope is preferred. For most purposes the ordinary stethoscope may be employed, care being taken that its lip is well flattened outwards, so as to avoid the pressure of an edge upon parts which may be too tender to bear it : for some purposes, however, as for the appreciation of the sound which percussion elicits, the solid stethoscope is the most applicable, since it conducts well all sounds arising in solids, and avoids the ringing shock which the ear receives from the column of air contained in the ordinary instrument. Referring the reader who desires information on the subject to the original essays on Auscultatory Percussion,* I shall pass on to the consideration of the ordinary method of auscultation.

Results of Auscultation in health.

The movements which occur within the abdomen in health, and which alone can be by possibility the sources of sound, are—1. Those of the opposed surfaces of the peritoneum upon one another during the movements of respiration, and the spontaneous or imparted movements of organs on one another. 2. The movements of the alimentary and secreted matter,—as gas within the canal either by the spontaneous action of the latter, or by impulsion from without. 3. The movement of the blood in the vessels. As to the first of these, as every provision is made for the easy sliding upon one another of all the organs contained within the abdomen by covering them with a smooth and slippery membrane, so, as the result of the same contrivance are these movements effected without sound. The passage of matters, however, into and through the digestive canal is not so completely deprived of friction, and thus, also, not performed without sound. On applying the stethoscope over the *stomach,* food and drink may be heard to enter it as low as its most depending part. When the stomach contains liquid and gaseous matters a variety of gurgling sounds are heard from their commixture, which sometimes assume the amphoric or metallic quality. When there is much liquid in the stomach, succussion may give rise to a sound of fluctuation, which may not only be heard through the stethoscope, but is audible at a little distance from the part. In health this phenomena is of only temporary duration, terminating with absorption of the liquid, or its passage through the pylorus. The sounds emitted from the *intestines* are termed borborygmi, and arise from the passage

* New York Journal of Medicine, 1840; and L'Union Médicale, 1850.

of the gas they contain through insufficient spaces from one part of the tube to another. They mostly occur during the intestinal part of the digestive process, and when absent may often be induced by taking a draught of cold water into the stomach. They occur abundantly during the contractions which ensue on the operation of a purgative. The flow of blood through the *veins* and *arterial branches* within the abdomen is accompanied by no sound in health. The *aorta*, however, imparts to the ear at each pulsation a single dull sound. This is scarcely audible, except in spare subjects, and then diminishes in intensity as the aorta is followed downwards, disappearing opposite its division into the iliac arteries. It is rarely that a second sound is heard.

Physical Signs derived from Auscultation in Disease.

These will consist in modifications of clearness, extent, and character of the several sounds which naturally are audible in the abdomen, and in addition to these in the appearance of new sounds. Beside these, auscultation applied to the chest indicates the effect which abdominal disease has upon the physical state of efficiency of the thoracic organs.

1. *In the peritoneum.*—When the surface of the membrane is roughened, the friction obviated by its healthy condition takes place, and under favourable circumstances not only affords a palpable sign of disease, but sound arises also in connection with it. The circumstances under which it may occur are the same as those described with the palpable sign. All roughenings of the surface do not appear to be accompanied by it, a certain amount of pressure and resistance being necessary for its production. Friction sounds may be audible also in cases where friction vibration cannot be felt. Their character presents every variation, from "gentle rustling" to loud "leather creaking" and roughness. As with the palpable sign it should be sought for frequently, and in various positions of the trunk.

2. *In the stomach.*—The sounds described as occurring in the stomach may be altered in their *quality* as well as in *locality* and *extent*. In quality they may assume a more or less amphoric character, sometimes with a distinct metallic tinkling echo. In these cases, the heart's sounds are heard over the stomach with the same accompaniment. As to their extent they may sometimes be heard in localities very distant from the natural seat of the organ, and in some cases to the lowest part

of the abdomen. When the *fluctuation sound on succussion* persists, it indicates either that the liquid is not absorbed, or does not pass readily through the pyloric orifice from the stomach.

3.—*In the intestines.*—The gaseous sounds, *borborygmi*, may be increased or lessened in frequency or loudness; they may also be especially evidenced in some part of the abdomen, or they may be inaudible altogether. Their diminution indicates a lessened activity in the intestinal contractions, while their loudness and frequency point to augmented irritability of the portion of the canal in which they occur When altogether absent it may be due to the intervention of a non-conducting medium between the intestine and the ear. *Gurgling* is sometimes heard in disease where fluid and gas co-exist in the intestine. The occurrence of it over the cæcum, when pressure is made in this situation in typhoid fever, is familiar to all. A *fluctuation sound* may be audible sometimes spontaneously, and whenever it occurs it points to an accumulation of liquid, which is put in motion by a powerful action of the intestinal wall. In some cases a sound of *grating* has been heard over the course of the intestines, which has arisen from the accumulation within it of solid hard substances. It has been said that in cases of *tænia* a sound has been heard which has been compared to a sound of very fine undulations, to the distant rolling of a wheel, or to that of a small body moving in a liquid. It is too delicate in its character to be confounded with borborygmi, or any other sound than the muscular.

4. *In the liver.*—There is no sound audible over the mass of the liver in health, but in some forms of disease of that organ auscultatory phenomena are observed. These are connected with the presence of a cavity containing air and more or less fluid in its substance or near its surface. In this case, *cavernous respiration, gurgling cavernous cough, and voice sound,* may be heard, or these may be accompanied under favourable conditions with *metallic tinkling.* These signs occur in connection with a communication with the lung, but gurgling and metallic tinkling with cough or on pressure may occur when the air has access from other sources.

5. *In the gall bladder.—Crepitation or grating* may occasionally be heard from solid hard bodies accumulated within it: this sound may be elicited by pressure.

6. *In the kidneys.*—The accumulation of similar hard bodies in the pelvis of these organs, if their position is such as to be readily arrived

at, may perhaps give to the ear the *sound of crepitation or friction* on pressure.

In addition to the above signs of disease in the abdominal organs, there is the *hydatid sound*, which corresponds in its characters with the sensation afforded to the fingers on percussion. Like the palpable sign, the conditions of its appearance are such that its clinical value is much diminished : it may be found in any situation in the abdomen where hydatids accumulate.

The following are the physical signs connected with the circulating system :—

1. *Increased intensity of the impulsive sound af the aorta* synchronous with the systole of the heart.

2. *Arterial murmur* may be sought either by application of the stethoscope over the course of the aorta in front, or in the back by the side of the spine. Where tumour is felt it may exist over it. It is mostly single, accompanying the systole of the heart, or it may be synchronous with its diastole, or both. In character and intensity it may vary between simple soft blowing and every grade of roughness and grating. Whenever it occurs it indicates an obstruction of some kind to the free flow of the blood ; this may be disease of the coats of the vessel, or it may be the partial compression of it by a tumid organ in its neighbourhood. In all cases the murmur will be more easily produced the more spanæmic the condition of the patient. In such patients moderate pressure of the stethoscope will produce and exemplify it. A murmur may be audible when the patient is recumbent, but inaudible when erect. An arterial murmur, or one allied to it in many of its characters, occurs as a sign of pregnancy, and as such will be alluded to hereafter. Under certain circumstances, where a communication has occurred between the aorta and vena cava, a loud roaring continuous murmur occurs, which may be perceptible not only at a distance from the patient, but also by the patient himself.

3. *Venous murmur* may be heard in the abdomen in certain cases where the blood is spanæmic, or when in addition some pressure is exerted on the vein. In the former case it is heard in other situations also, as in the jugulars ; in the latter it is localized. It is always continuous, varying however in its special similitude, but soft in its tendency and often humming as it occurs in the abdomen. When the vein in

which it occurs is near the diaphragm it is increased in intensity at each beat of the heart, and with each inspiration.

Abdominal disease often modifies the sounds of the chest just as disease of the chest produces signs referable to the organs of the abdomen. I shall confine myself to the enumeration of those signs which may thus be produced independently of disease, either primary or consecutive, of the lungs or heart themselves.

1. *Defective respiratory murmur.*—The lower limits of natural breath sound may be raised considerably in cases where abdominal enlargements raise the diaphragm, and compress the lung toward the upper region of the thorax. In cases where disease interferes also with the expansion of the thoracic cavity, on one or both sides, the respiratory murmur may be proportionally weakened. The same thing, and even *suppression* of murmur over a certain space may occur from the effusion into the pleura or lung or morbid products from the abdomen.

2. *Exaggerated respiratory murmur.*—This may occur on one side as compensatory for defective respiration upon the other, or may in certain cases which interfere with the diaphragmatic respiration appear over the upper regions of the chest. In some of these cases *harshness* may be conjoined.

3. *Tubular breath sound* may occur from compression of the lung by such abdominal disease as elevates the diaphragm: it may be on one or both sides, and is generally most distinguishable on examination of the back in the neighbourhood of the larger tubes.

4. The rhonchi which arise in connection with abdominal disease are the following:—1 A variety of crepitation described by Dr. Walshe as the "*hepatic compression rhonchus*," which he believes to arise from the expansion or uncreasing of a compressed and creased portion of the lung. It only occurs in forced inspiration, not commencing till the respiratory murmur is almost at an end; it is very slowly evolved, and consists of a great number of excessively fine, dry, rather superficial crepiti, which are audible at or near the upper edge of the liver. 2. Mucous rhonchus may occur in connection with the effusion of liquid products of disease into the air tubes from the abdomen. 3. The existence of *cavernous* rhonchus would indicate consecutive destructive disease of the tissue of the lung itself.

5. The *seat* of the heart's sounds may be altered by being raised above the natural level in some cases of abdominal enlargement. They are occasionally heard more to the right than usual.—*Medical Gazette.*

REPORT MADE TO THE ACADEMY OF MEDICINE ON THE SUBSTITUTION OF AN ARTIFICIAL IODISED OIL FOR COD LIVER OIL.

BY A COMMITTEE COMPOSED OF MM. GIBERT, RICORD, SOUBEIRAN AND GUIBOURT (REPORTER.)

(Concluded from page 251.)

We shall now proceed to the consideration of the note of M. Deschamps sent to the Academy on the 31st August, 1850, eleven days after the presentation of the memoir by M. Personne. This note is likewise on the subject of *the preparation of an iodised oil, intended to replace cod liver oil.* We find in it the results of numerous experiments the products of which were sent to the committee, and which could not have been made during the time which intervened between the presentation of the two papers. The result has been a conviction in our minds that M. Deschamps, unacquainted with the Work of M. Personne, was employed in finding a substitute for cod liver oil. We can therefore, concede to M. Personne only the priority of presentation.

M. Deschamps has caused iodine to act on oil of sweet almonds, and even on olive oil, in proportions varying from 1 to 56 per cent., and he has done so both directly and by the intermedium of alcohol. A certain number of peculiar products have thence resulted, which may become very interesting, but the examination of which is not yet concluded, and to which the author proposes returning. For this reason we think that we ought not to employ the time of the Academy with them, and we confine ourselves to making known the process by means of which M. Deschamps prepares his *medicinal iodised oil.*

℞ Oil of sweet almonds	100 grms.*
Alcholic solution of iodine (at 12 per cent.)	24

* A gramme is equal to 15,40 grains troy.

Pour the mixture into a retort, introduce into it a leaf of platinum, and distil carefully until the oil is decolored; withdraw the liquid from the retort, wash it first with water containing one-thousandth of its weight of bicarbonate of soda; afterwards with pure water. Separate the oil, agitate it with two grammes of starch, heat in a sand bath for an hour, filter and preserve it.

100 grammes of this oil contain, according to the analysis of M. Deschamps, 52 centigrammes* of iodine, that is to say, the same proportion as that of M. Personne, although the quantity of iodine dissolved in the alcohol is double that used by the latter chemist. This is explained by the peculiar action exerted by iodine on alcohol, and by a necessarily more considerable formation of hydriodic acid. Moreover, the author advises the analysis of a small quantity of oil after each operation, so as to be more certain of the proportion of iodine contained in it.

The oil thus prepared, as well as that of M. Personne, differs but little from oil of sweet almonds, either in color or taste, and is easily administered to patients, either pure or made into an emulsion with gum. We consider these two oils as identical; but as the process of preparation given by M. Personne is not complicated by the action of alcohol, and as it should produce more readily an always uniform medicament, we think that it should be preferred.

Before going into the therapeutical properties of this oil, we must pay attention to the claim of priority set up by M. Marchal (of Caloi). In this claim, M. Marchal quotes an article by Dr. Foucard, inserted in the *Gazette des Hôpitaux* of the 1st February, 1848; and it is indeed in this article that we find the proof of the fact advanced.

It is therein seen that M. Marchal, starting from this fact, incontestible in his opinion, but very contestible in ours, that cod liver oil owes its properties to iodine, and *iodine alone*, has wished to substitute for it an artificially iodised oil, containing a much larger quantity of iodine. We find likewise that M. Marchal, in proposing this medicament, depends on this, that iodine dissolved in an assimilable organic substance, should be retained longer in the economy, and should act more efficaciously as a medicament, than when it is administered as simple or iodureted iodide of potassium. Thirdly, M. Marchal has chosen a fat substance as excipient, because substances of this nature are directed immediately into the small intestines where they are

* A centigramme is equal to 0.15 of a grain.

formed into an emulsion of the bile,* which relieves the stomach; very important circumstances when we speak of so powerful a substance as iodine. M. Marchal can therefore administer 30 centigrammes of iodine in a day under this form, whereas 5 centigrammes, introduced into the stomach in the state of alcoholic or aqueous solution, cause a very intense irritation of this organ. This observation is confirmed by M. Gibert, a member of the committee, who thus expresses himself on the subject of the experiments on iodised oil tried in the hospital of Saint Louis :—

"The first result of these trials, that which is the most striking, is the possibility of thus administering very considerable doses of iodine without the manifestation of any poisonous effects. Whilst it is impossible to use iodine dissolved in iodide of potassium, in a daily dose of from 5 to 10 centigrammes, without the appearance of symptoms of gastro-intestinal irritation, we can, without inconvenience, administer 10 to 12 grammes of M. Deschamp's *brown iodised oil*,† and the *colorless iodised oil*, which is that most frequently administered, may be given in a dose representing from 20 to 30 centigrammes of iodine, without producing any immediately apparent effect. However, the secretions from the body, and especially the saliva, show the presence of iodine after the very first doses."

The iodised oil of M. Marchal is prepared by dissolving 5 parts of iodine in 100 parts of oil of sweet almonds. The dissolution should take place on the very day on which it is wanted for use and not before, as, after a very short time, the oil changes its color, which proves that some alteration takes place, of which we do not know the nature. The iodised oil may be given in the natural state, but it is better made into an emulsion. Finally, the dose is from 1 to 6 grammes each day; this last dose, which represents 30 centigrammes of iodine, should not be exceeded.

We have now given an analysis of the note inserted in the *Gazette des Hôpitaux* of the 1st February, 1848. The result is, that M. Marchal is proved to have been in advance of MM. Personne and Deschamps in the idea of substituting an artificial iodised oil for cod liver oil. He

* We should now say by the pancreatic juice.

† Prepared by the direct action of one part of iodine on ten parts of oil, and retaining after the washing, according to the analysis of M. Deschamps, 8 per cent of iodine.

likewise appears to have been the first to apply this iodised oil to the resolution of ganglionic swellings, for the cure of all scrofulous symptoms (ophthalmia, dermatosis, adenitis, osteitis, &c.), and of tertiary symptoms of syphilis, which appear to him as forming a transition state between syphilis and scrofula ; but we must, more than ever, make the remark that an oil containing 1,750 times more iodine than cod liver oil cannot be compared with it ; and that it is an entirely separate medicament, undoubtedly eminently useful, but which should not be confounded with cod liver oil.

We must now exculpate M. Personne from the accusation brought against him by M. Marchal, of having been aware of the composition and application of his iodised oil, which is used in the practice of M. Ricord, at the *Hopital du Midi*, of which he, M. Personne, is the head pharmaceutist, of having said nothing about it, and of having thus wished to attribute to himself the priority of the idea, and of the application of this medicament. (See the *Gazette des Hôpitaux*, Sept. 12, 1850.

To this M. Personne replies, that having been pharmaceutist to the *Hopital du Midi* only for one year, he had not seen the *Gazette des Hôpitaux* of 1848, and that the only formula which he found in use at the *Hôpital du Midi*, on his taking office was transcribed in the following manner in the register of the establishment :—

IODISED EMULSION (PRACTICE OF M. RICORD),

R Oil of sweet almonds.....	33 gram.
Syrup diacodium.....	30 "
Gum arabic.....	15 "
Water q.s. to form 125 grammes of emulsion.	

Add :

Tincture of iodine.....	4 gram.

Whence came this formula ? M. Personne does not know, but it was the only one in use at the *Hôpital du Midi* ; it is neither like the iodised oil of M. Marchal nor cod liver oil ; it has besides every inconvenience connected with the internal administration of the alcoholic tincture of iodine. It was therefore useful to substitute for it a preparation more analogous to cod liver oil. M. Personne has endeavoured to do so, and we think that he has succeeded.

On the other hand we must remark on the great difference existing between the iodised oil of M. Marchal and that of M. Personne. The first contains all the iodine employed, even to a twentieth of its weight. M. Marchal has however, observed, that this iodine reacts on the oil, which renders the composition variable; but to avoid this variation, he recommends using the iodised oil on the very day of its preparation; which renders it always certain, and which is one reason that the iodine being for the most part only dissolved on the organs and retain a portion of its irritating action. We should even say, that if M. Marchal has been able, without inconvenience, to use constantly and daily 30 centigrammes of iodine dissolved in oil, it is probably because his recommendation of preparing the medicament each day, has not been exactly followed, and consequently the oil was often used several days after its preparation.

M. Personne, on the contrary (and what we say applies equally to M. Deschamps), has wished to ascertain, as was his duty as a pharmaceutist, what passes between the oil and the iodine; and to avoid the inequality of action caused by time, he carries the chemical reaction to its furthest limit; he disembarrasses himself from all that is foreign to the elementary combination of iodised oil, and has formed a veritable officinal medicament, stable in its composition, and capable of being preserved for a long time.

(*To be continued.*)

MEDICINE.

Treatment of Aphonia by Inhalation of Stimulant Vapour.—Dr. Pancoast draws attention to the successful treatment of a form of aphonia which sometimes succeeds to an ordinary cold, without leaving any perceptible organic lesion in the pulmonary apparatus. The voice is reduced to a mere faint, hoarse whisper, distinguishable at only a few feet; and a continuance of attempts to talk induces great fatigue, as if from an obstruction in the larynx. There is little or no difficulty of breathing, and the patients can undergo a considerable amount of bodily exertion.

Dr. Pancoast, believing this condition to be due to a partial paralysis of the muscles regulating the motions of the *chordæ vocales*, determined upon the employment of stimuli. In his first case, the aphonia, supervening on a cold in a healthy girl, had resisted all treatment for six months. He caused her to inhale chlorine gas for some minutes two or three times a day according to the amount of irritation it induced, and in three days her voice was as strong as ever. Recently he has treated an eminent medical practitioner, who was prevented by an aphonia of seven months's duration from pursuing his profession, and who had in vain, among other means, repeatedly applied strong nitrate of silver lotion to the glottis. In from a week to ten days his voice was quite restored.

Spontaneous Hydrophobia.—Dr. Condie reports a case of this curious occurrence. A man, æt. 35, of temperate habits, who could recollect no severe illness, except a short convulsive attack several years ago, was seized on the morning of Aug. 28 with stiffness along the left side of the neck, and a sense of numbness in the arm of that side. This was followed by pain extending from the occiput along the left side of the neck and body, thirst, a sense of suffocation, and convulsions on attempting to drink, and, next day, by the fully developed symptoms of hydrophobia. He died on the morning of the 30th. No autopsy. He declared he had never been bitten, nor had he received any wound or contusion for eighteen years. A minute examination could detect no cicatrix.

ON THE TREATMENT OF PRURITUS OF THE GENITAL, ANAL, AND AXILLARY REGIONS.

BY DR. TOURNIE.

What is generally designated by the term pruritus of the genital and axillary regions, is a cutaneous affection, under the form of prurigo, lichen, or eczema, of which the itching is nothing more than a symptom, and one of the principal phenomena, although it may sometimes exist without any apparent alteration of the skin, and without any other characters than that of the itch itself.

Without constituting a true disease, the itching is not the less a most inconvenient and disagreeable affection; moreover, it may sometimes determine, in nervous person, consecutive symptoms of manifest importance. We know that onanism and nymphomania often owe their origin to these violent itching.

There are few practitioners who have not had occasion to observe some one of these troublesome affections; and who, perhaps, have more than once deplored the inability of the materia medica to cure this intractable malady. Among the remedies in common use are corrosive sublimate, borax, sulphur, camphor, iodine, &c. With the aid of these means cures have been obtained; but none, in Dr. Tournié's experience, produced such constant and successful results as the following, which he employed in nine cases of pruritus of which he has reported the details:—1. An ointment of calomel, in the proportion of from 4 to 6 parts of calomel to 30 of axunge. 2. A powder, composed of four-fifths of starch and one-fifth of camphor, well pulverised and mixed. We may, however, in the ointment, increase the proportion of protochloride of mercury; and, in the powder, the dose of camphor, according to the obstinacy of the disease.

The mode of application is as follows;—If the diseased parts are covered with scales or dry crusts, as in eczema, then separation is promoted by cataplasms and emollient baths; having accomplished which, he applies, twice a-day, frictions with the foregoing ointment, and, after the frictions, sprinkles the parts with the mixture of starch and camphor.

The ointment alone is inefficacious; and the camphorated starch, without the assistance of the ointment, allays the itch, but does not effect a cure. Experience has proved this.

The following are the cases of which he has reported the details:—1. Prurigo of the labia majora and vulva—intertrigo. 2. Lichenoid affection of the labia majora—intertrigo. 3. Chronic eczema of the scrotum. 4. Lichen in axillary region. 5. Itching of anus. 6. Ditto, do. Besides these, he notices three other cases of perfect cure by this treatment, two of lichenoid affections of the anus in men, and one of the prurigo of the labia majora in a woman. He does not give the details of these last three cases. In one only—viz. that of the fourth case—was it necessary to increase, in a notable manner, the

doses of calomel and camphor; in all the other cases, the ordinary formula was sufficient to produce a cure.

When the itching of the anus is caused by the presence of ascarides the calomel and camphor are less efficacious; but he has recourse in this case to mercurial ointment, and often verified its vermicide effects on this species of worm.

The state of pregnancy seems to neutralise the action of the therapeutic means, the success of which he has recorded above. Thus the itching of the genitals in two pregnant females proved intractable to every kind of treatment. In one only venesection seemed to allay the itchiness a little; but in the second it produced no effect;—in both, the itching disappeared immediately after delivery. In these two cases the itching had commenced during pregnancy; and it existed without giving the vulva any appearance of a lichenoid or pruriginous eruption.

Dr. Maslieurat-Lagemard has published, in the 12th No. of the "Gazette Medicale," for 1848, page 204, a very curious and remarkable account of general itching supervening, without eruption, in the course of eight pregnancies, in one of his patients. This did not commence till after the sixth month, and no treatment appeared to alleviate the violent itchings, which during the eight pregnancies resulted six times in premature deliveries.

In Dr. T.'s hands the combination of the calomel ointment with the powder of camphorated starch, in the treatment of itching of the hæmorrhoidal region, has given results which no other treatment has ever obtained in so constant a manner.

Every practitioner who has been consulted for these affections has been obliged to direct himself to formulæ of great variety, before hitting on a successful expedient. In illustration of this, it is sufficient to relate the summary of five observations published by Dr. Ruan, in "Huffeland's Journal."

On these five cases, two were treated without any success by purgatives, diuretics, opium in large doses, Goulard's extract, and solution of borate of soda; intractable to all these means, they were cured by the balsam of copaiva.

In a third case, the copaiva, which had succeeded in the two first, was inefficacious; whilst the borax which had failed in the others, caused the itching to disappear in this case.

A fourth case resisted the divers means employed for the three first, and gave way to the administration of the subcarbonate of soda in small and repeated doses.

The fifth case resisted every treatment.—*From L'Union Médicale,* 16th January 1852.

[Dr. Tournie takes no notice of hydrocyanic acid,* which, in the proportion of a drachm to eight ounces of almond emulsion, we have found frequently to give great relief. In *prurigo ani* and *pudendi,* we have more frequently succeeded in effecting a cure with a weak solution of corrosive sublimate (one grain to eight ounces) than with any other application. The state of the digestive function and urinary secretion should always be attended to, whatever be the local treatment.]

Treatment of Painful Affections on the Skin by M. Cazenave.

M. Cazenave employs successfully, in the treatment of painful skin diseases, such as eczema, prurigo, &c., the following ointments, which rapidly alleviates suffering by causing the cessation of the violent itching :—Chloroform, 1 to 2 parts ; azuuge, 30 parts. Mix and make an ointment.—*Union Médicale,* 7th December 1850.

PHYSIOLOGY.

ON THE PRODUCTION OF SUGAR IN THE LIVER OF MAN AND ANIMALS. BY CLAUDE BERNARD, PROFESSEUR SUPPLEANT AU COLLEGE DE FRANCE, &c., &c.

(Translated and contributed by Dr. W. R. Sanders.)

Although it has long been known that, under certain conditions, sugar may be found in the blood and other animal fluids, yet, hitherto, the presence of saccharine matters has always been considered as accidental, and dependent exclusively on the nature of the food. In the present note, I shall demonstrate by the result of my experiments :—

1. That the presence of sugar in the animal organism is a constant fact, and is indispensable for the regular accomplishment of the phenomena of nutrition.

2. I shall prove that the presence of sugar in the animal body is not dependant on the kind of food, but that sugar is formed in the liver by a special function of that organ.

* Nor of the Sol of Argenti Nitras (gr. iij to $\overline{3}$j of water) in pruritus of the vulva or Scrotum. The solution is applied three times daily. This has been tried with great success while all other means have failed.

3. I shall, finally, point out the principal characters of the production of sugar in the liver, showing that it is in immediate dependance on the nervous system.

1st, Of the presence of sugar in the organism. *During the period of digestion, the blood which issues from the liver by the hepatic veins,* invariably contains sugar, both in man and animals, whatever the nature of their food may be.*

The liver in most animals, and particularly in mammifera, is placed intermediately between the abdominal and the general circulation, so that the blood of the ventral vena portæ, returning from the spleen and intestines, must pass through the tissue of the liver before arriving at the heart. Now, without attending for the present to the source of the sugar, I first establish the general facts:—1st, That it is by the hepatic veins, and them alone, that the sugar is conveyed into the general circulation; and 2d, That, when the hepatic veins carry sugar, the tissue of the liver is also saturated with it in a high proportion. No other organ of the body is in the same condition, so that the constant presence of the saccharine principle is distinctive of the tissue of the liver during digestion. These facts have been proved by a very great number of direct experiments, and confirmed in a variety of animals belonging to nearly every order of the zoological series. Without entering on details, I shall enumerate the species on which my investigations have been made.

On man, in the state of health, I have three times had the opportunity of ascertaining the presence of sugar in the liver: first on the body of an executed criminal; next in an individual killed accidentally by a gun-shot; and, lastly, in a case of sudden death.

In the class mammalia:—*Quadrumana*—the cynocephalous ape. *Carnivora*—dog, cat, hedgehog, mole. *Rodentia*—squirrel, guinea-pig, rabbit, hare, black rat, and brown rat. *Ruminantia*—goat, sheep, ox. *Pachydermata*—horse, ass, pig.

Birds. *Rapaces*—hawk, owl, strix, and ulula. *Passeres*—swallow, sparrow, raven, lark. *Gallinaceæ*—pigeon, turkey, cock. *Grallæ*—snipe. *Palmipedes*—goose, duck.

Reptiles. *Chelonian*—land-tortoise. *Saurian*—green lizard, and grey lizard. *Ophidian*—anguis fragilis, coluber, and common viper. *Batrachian*—common frog, grenouille rousse, red frog, brown toad, aquatic salamander, or triton.

Fishes.—Osseous. *Acanthopterygian*—common perch, labrax, thunny. *Abdominal Malacopterygian*—common carp, barbel, leuciscus, common trout. *Subbranchial Malacopterygian*—cod, turbot. *Apodous Malacopterygian*—common eel, conger-eel.

* "Veines sus-hepatiques," in French.

Chondropterygian or Cartilaginous Fishes. *Sturiones*—sturgeon. *Selacian*—sea-dog.

Mollusca. *Gasteropodous—pulmonary*—the red slug, grey slug, common snail, fresh-water snail. *Pectinibranchiata*—paludina vivipara. *Acephalous M.* or *Lamellibranchiata*—the edible oyster, pecten, mussel, anodont, and unio.

Among the Articulata, I have detected sugar in the liver of some *decapadous crustacea*, as the crawfish and lobster; but in this branch of the animal kingdom the organs of nutrition undergo such profound modifications that the determination of the liver would lead to unnecessary discussion.

The numerous researches cited above have all been made on animals in full health, and during digestion, or shortly after it. They are, I think, sufficient to prove that the presence of sugar in the liver is a general fact, both in man, and in all animals evidently provided with that organ.

In proportion as the act of digestion draws to a close, the quantity of sugar poured by the hepatic veins into the general circulation gradually diminishes; and, at the same time, the tissue of the liver eliminates by degrees all the saccharine matter which it contained. But in warm-blooded animals which are in good health, and in the usual conditions of supply of food, there is never complete absence of sugar from the liver, because the digestion of another meal commences before the quantity of saccharine material already formed is exhausted. If, however, we subject animals to forced abstinence, the sugar after a time completely disappears, and the liver exhibits no more trace of it than any other organ of the body.

Accordingly, as it is a fact that in all animals during digestion the hepatic tissue, and the blood which issues from it, constantly contain sugar, so it is equally true inversely, that in all animals subjected to abstinence prolonged sufficiently, the liver and hepatic blood are entirely deprived of saccharine matter, which, however, immediately re-appears as soon as digestion and nutrition resume their activity.

The duration of abstinence required for the complete elimination of sugar from the liver presents many variations according to species, age, health, &c. I shall merely state, that in birds the disappearance is very rapid, occurring at the end of two or three days; while, in dogs, it is complete only at the end, of seven or eight days of starvation. In cold-blooded animals a much longer time is required.

We shall afterwards observe, that in cases where the function of digestion is disturbed or disordered, one of the first results is the disappearance of sugar from the liver and from the blood of the hepatic veins. Hence, the presence of saccharine matter there must be regarded in animals in their ordinary condition as the indication of the normal performance of digestion.

2d. *Sugar produced in the liver independently of the nature of the food.*

The experiments above-cited might serve to show that the sugar is formed in animals without the intervention of saccharine or amylacious principles in the food, since the presence of sugar was detected in carnivora, as well as in omnivora and herbivora in the animal series. However, as the fact of the production of sugar in the liver is still new, and has most important bearings on physiology, I shall support the above proposition on the evidence of special and direct experiments.

To demonstrate that the saccharine matter originates in the liver, and is not introduced with the food, animals such as dogs, cats, or even rabbits, must be subjected to a diet exclusively animal, and containing no substance which can by the process of digestion give rise to saccharine principles in the alimentary canal. Thus, I have fed dogs during three, four, five, and even eight months exclusively on flesh, and on examination at the end of that period, I have constantly found that, while the intestines and blood of the vena portæ at its entrance into the liver, contained no sugar, the blood of the hepatic veins was always abundantly charged with it. But an experiment less prolonged proves the production of sugar in the liver. In fact, as before stated, the dog's liver may be completely deprived of sugar by an abstinence of seven or eight days' duration. If, at the end of that period, the animal be fed on flesh only, the sugar will nevertheless re-appear in the liver as soon as the process of digestion determines increased activity in the circulation of the organ. When, therefore, in animals fed exclusively upon flesh, it is constantly ascertained that the blood brought to the liver by the vena portæ contains no sugar, and that the blood which leaves the organ by the hepatic veins is always charged with it, we must admit, that the blood acquires the saccharine principle in passing through the hepatic texture, or, in other words, that the liver is endowed with a peculiar function, in virtue of which sugar is produced.

The liver, therefore, performs two functions at the same time, namely, the secretion of bile and the production of sugar; and the latter function commences even before birth, for I have detected sugar in the liver of the young of mammalia and birds at different periods of fœtal life. It is remarkable that while the bile, like other intestinal secretions, is poured out into the alimentary canal, the sugar, on the contrary, mixed with the portal blood returned from the intestines and spleen, is carried out into the general circulation, and disappears in contributing to the phenomena of nutrition. This separation of the bile and sugar, however, occurs only in vertebrata; for in molusca, I have found the biliary fluid highly charged with saccharine matter.

The sugar produced in the liver, presents the chemical characters of glucose. Along with M. Barreswill, I have ascertained the following properties:—

1st, The saccharine principle of the liver ferments when put in contact with yeast, and yields alcohol and carbonic acid.

2d, Its solution is rendered brown by the caustic alkalies, and reduces the tartrate of copper dissolved in potass.*

I ought to add, that the hepatic sugar undergoes spontaneous destruction in contact with blood and animal textures, much more rapidly than ordinary glucose,—a circumstance indicating that to operate in favourable conditions, the search for sugar in the liver should be made on animals recently dead.

3d, Influence of the nervous system on the formation of sugar in the liver.

The formation of sugar in the liver is a function placed under the immediate influence of the nervous system.

In vertebrata, the liver receives two kinds of nerves supplied from the pneumogastric and the solar plexus. In this, as in other functions, it is difficult to determine the kind of participation which the nervous system has in the chemical acts of nutrition. It is, however, incontestible that some of the phenomena of nutrition cannot be produced external to the living individual, and are connected in an immediate manner with the integrity of the nervous system, so that we can extinguish, exalt, or disturb these chemical phenomena simply by modifying the nervous organs which influence them. In particular, those functions, generally periodical, designated in physiology as secretions, are so placed; and I shall show that the production of sugar in the liver belongs to the same category.

Thus, for example, whatever be the kind of food, we can cause the complete disappearance, in a few hours, of the saccharine matter of the liver in dogs or rabbits by the section of the pneumogastric nerves in the middle region of the neck. The same result occurs whenever, by any means, a violent commotion of the nervous system is produced.

In the whole extent of the nervous system, I have found only one limited spot of the medulla oblongata, where a lesion occasions the opposite effect. Thus, when in dogs or rabbits, we succeed in pricking the medulla oblongata with a sharp-pointed instrument within the narrow space, limited below by the origin of the pneumogastric, and above by the emergence of the acoustic nerves, we ascertain, after a short lapse of time, that the saccharine principle has been formed so abundantly as to spread throughout all the organism. The blood and other liquids of the body are surcharged with it; the urine eliminates the excess; the animal is diabetic.

Thus we can cause the excess or disappearance of sugar solely by modifying the phenomena of innervation.

In conclusion, from the results presented in this paper, I think I have proved beyond doubt the production of sugar in the liver of man and animals, and

* The latter test is the one commonly used by M. Bernard to detect the presence of sugar.—W. S.

have established the existence of a function which, up to the present time, had remained entirely unknown.

Period of Menstruation.

Much attention has been given by Mr. Roberton to the allegation of very early puberty so commonly held in regard to the Hindu female; and the information he has collected on this subject is not a little curious.

The *mean age* at which the first menstruation occurs in the Hindu female, as deduced by Mr. Roberton from 597 cases collected by different observers, is nearly two years lower than that deduced by him from the 2169 cases collected in England by Drs. Lee and Murphy and himself; the former being 13 years, and the latter being 14 years 11 months. This does not arise, however, from the antedating (so to speak) of the puberty of the whole population, but only from the fact that *a larger proportion* of first menstruations takes place among Hindu females during the *earlier* years of that period over which they are spread in English females, the distribution in the latter being more equable. This will be apparent from the following Table: (p. 125.)

Ages.	Bengal. Calcutta.	Deckan. Bangalore, Toomkoor, and Bombay.	Both.	England.
8	3	—	3	—
9	7	1	8	14
10	14	4	18	55
11	37	43	80	77
12	66	79	145	142
13	49	90	139	263
14	41	64	105	396
15	11	34	45	417
16	6	18	24	340
17	3	15	18	215
18	1	4	5	138
19	—	3	3	65
20	1	—	1	33
21	—	2	2	9
22	—	—	—	4
23	—	1	1	1
	239	358	597	2169
	Mean Age.			
	12 ys. 6 m.	13 ys. 5 m.	13 ys.	14 ys. 11m.

A glance at this table will show that the greatest number of first menstruations occur among Hindu females in the 12th, 13th, and 14th years; whilst among females in this country, the largest proportion presents itself in the 14th, 15th, and 16th years. The proportion of menstruations *under eleven years* is not at all remarkably different in Hindustan and in England; so that the current idea of the *very early puberty* of the Hindu females is altogether

incorrect. Dr. Tilt furnishes, in addition, 37 cases collected by Dr. Stewart at Bombay, which do not materially affect the average; yet he is very wroth with Mr. Roberton for not having noticed these cases. On the other hand, Mr. Roberton has been informed by Professor Webb, that, in the Calcutta Government School, of 200 girls, Indo-British and British born, under his charge, *sixteen years* is the average age of menstruation.

It is evident, then, that climate cannot be the sole or even the chief determining cause of the difference in question; for Demerara and the West Indian Islands have a higher mean annual temperature than Calcutta and the Dekhan; and yet the Negresses of these colonies, like the Europeans and Indo-Europeans of Calcutta are not at all earlier in their attainment of puberty, than females of the corresponding classes in this country. It is possible that it may be dependent upon difference of *race*, especially if, as now seems probable, the mass of the Hindu population belongs rather to the Mongolian stock than to that from which the European nations, as a whole, are offsets; but there is strong evidence that the cause partly lies in the peculiar habits of the natives of India, which tend, in more ways than one, to force forwards the period of puberty; and this view, as we shall presently see, is quite compatible with that just advanced:

"A fact, already repeatedly referred to, but hitherto, I apprehend, unknown to Europeans, is the law of the Shastras, that females shall be given in marriage *before* the occurrence of menstruation; and that, should consummation not take place until after this event, the marriage is a sin. Accordingly, it is the custom in Lower Bengal, to send the girl at the age of nine years to the house of her husband, unless the latter be so distant that it cannot be done: and two ancient Hindu sages are of opinion, that if the marriage is not consummated before the first appearance of the catamenia, the girl becomes "degraded in rank." Testimony to the same effect is given by Professor Webb; who likewise joins the Baboo in thinking that, in those alleged instances of very early menstruation, a discharge of blood from injury in premature intercourse is the real explanation of the occurrence; a supposition worthy of consideration, when endeavouring correctly to estimate the value of the Calcutta tables. At Bangalore it would seem, that this revolting custom of consummating the marriage before puberty, does not obtain, the husband refraining from taking his wife to his own house, till not less than sixteen days have elapsed subsequently to puberty. Customs, we know, differ in different parts of our great eastern empire. I had occasion formerly to refer to the diversity of manners and even morals, in so vast a country. In the present instance it might readily escape notice, when speaking of Calcutta and Bangalore, that these two cities are about as widely apart as to distance, and probably not less diverse in customs and manners, than are Copenhagen and Madrid, the capitals of Denmark and Spain." (pp. 130-1.)

Now, it is a confirmation of this view, that the difference in custom which thus obtains between Calcutta and the Dekhan should be accompanied by a marked difference in the age of the (reputed) first menstruation; for whilst in the former we have seen it in the table to be 12½ years, in the latter it is nearly 13½, and this notwithstanding a more equatorial latitude. It can scarcely be questioned that such a premature sexual excitement will have a tendency to accelerate the epoch of puberty; and that, when this is constantly acting through a long succession of generations, an early puberty may be established

as a character of the race. But, besides this *modus operandi* of the custom in question, the following is pointed out by Mr. Roberton :

"When it is recollected, that the consummation of marriage among the Hindus has taken place, at the latest on the arrival of puberty, during the lapse of more than 3000 years, and that the practice is sanctioned by ancient laws and consecrated by custom, it is easy to conceive, that those females who were the latest in reaching puberty, would be the least sought after for wives ;—that such women would not unlikely, in many instances, remain unmarried ; and that thus, (owing to the origination of a preference on this ground in the selection of wives, operating through a long period of time,) Hindu women would gradually come to consist, in a proportion different from that in Europe or elsewhere, of such as by constitution are early nubile. To me there seems nothing extravagant or far-fetched in this supposition. The production of a like state of things in England, in any particular district, is quite conceivable. Nothing is better established than that early puberty is a family peculiarity. Let us, then, only suppose families, possessing this kind of constitution to intermarry, and the peculiarity in question would be propagated, extended, and transmitted, and so a race distinguished by it, would be produced." (pp. 128-9.)

SURGERY.

Reduction of old Dislocations of the Hip.—Dr. Crosby reports a case, in which he reduced one on the sixty-eighth day, chloroform being employed, and the traction maintained for four hours. Professor Atlee reduced one of *four months'* standing. After rendering the patient insensible, the reduction was accomplished in *one minute*. In both cases, Jarvis's adjuster was employed.

Chloroform in Traumatic Tetanus.—Two cases are related in which this was successful. One occurred in a lad, æt. 15, who had been wounded by a stick thrust into the perineum; and during the suppuration of the healing wound, tetanus occurred on the seventeenth day. Purgatives and morphia having failed to give relief, chloroform was resorted to, and inhaled whenever a paroxysm came on, with the effect of procuring a recovery in a case which, before its employment, seemed hopeless. The other case occurred in a man, æt. 29, who received a wound from an adze below the internal malleolus. Six weeks after the injury, violent spasms came on, and continued very severe for a week, during which there was opisthotonos as well as rigidity of the muscles of the abdomen and jaws. Morphia and alcohol were freely given, and sinapisms applied to the spine with only palliative results. Chloroform was next inhaled, and a mixture of it and alcohol applied to the wound. Relief was obtained in two or three days ; and by repeating its inhalation whenever a paroxysm returned, a cure was accomplished in a fortnight.

Professor Pancoast on the Sub-cutaneous Division of recently Strangulated Hernia.—In cases of hernia, where the seat of stricture can be detected at the external ring, and where the surgeon is so well satisfied with the state of the contents of the sac, as to be willing to restore them by the taxis if that were possible, Dr. Pancoast considers that the sub-cutaneous division of the upper column of the external ring may be most advantageously substituted for the ordinary operation in which all the tunics are laid open. The operation was devised by M. Guerin ; but as far as Dr. Pancoast knows, his own three cases are the only ones in which it has been practically carried out. In these its success was complete. The operation is applicable only to a small proportion of the cases which call for surgical interference, the seat of stricture being so commonly found at the neck of the sac ; but in these cases it will be found of great value.

GENERAL ORDERS.

PROMOTIONS &c.

G. O. G. 8th June 1852 *No.* 109.—Senior Medical Apprentices Henry Flattery, Henry Crawford, Charles James Daly, Charles Wood. Passed Medical Apprentices Charles Georges, Richard Wilkins, to be Assistant Apothecaries from the 5th June 1852.

G. O. G. 15th June 1852 *No,* 114.—2d Apothecary John Munro, to be Acting Apothecary until further orders.

G. O. G. 18th June 1852 *No.* 116.—Assistant Apothecary John Alcock to be Acting Second Apothecary. Passed Medical Apprentice Henry Hackett to be Acting Assistant Apothecary, from the 15th June 1852, in succession to Munro promoted.

G. O. C. C, 10*th June* 1852.—2d Class Native Medical Pupil A. Lutchmenaroidoo No. 365 — To be 1st Class Native Medl. Pupils. — From the 27th April 1852 in succession to Cajah Fareed Obden, No. 323 Nathamooree, No. 350 T. Rasuntheram No. 338 T. Yeatherajooloo, No. 326 M. Apparoo, No. 362 A. T. Apparoo, No. 331 C. B. Sashadree Naicker, No. 381 and Jay Singh No. 339 promoted.

Medical Pupil	do.	M. Thamiah No. 361
	do.	S. Zecharaiah No. 383
	do.	S. Aubyen No. 387
	do.	T. Ballakistnah, No. 340
	do.	Kistnamah Rauze, No: 341
	do.	P. Ramasawmy, No. 329
	do.	A. Davasegaumoney, No. 375
3d Class	do.	C. Mootoosawmy, No. 393
	do.	Iyavoo, No. 394
	do.	R. Valoyden, No. 395
	do.	P. Ponnoosawmy, No. 396
	do.	P. Vencata Sameiaidoo, No. 397
	do.	W. Colendavoloo, No. 398
	do.	T. Venkatasawmy Moodly. No. 399
	do.	Samuel Sumapen, No. 400

To be 2d Class Native Medl. Pupils.

A. T. Veerasawmy Moodeliar No. 413 dd, 52d Regt. N. I.
S. K. Vencataram Naidoo 414 dd. 28th Regt. N. I.
Arzellah Vencatasawmy, 415 dd. Jail Hospital Vizagapatam.
Lazarus Marian, 416 dd. Triplicane Dispensary.
R. Jacanaycooloo, 417 dd. 4th Battalion Artillery.
A. C. Maucellamony, 418 dd. 51st Regiment N. I.
N. R. Canakasawmy, 419 dd. Civil Dispensary Nellore.
P. T. Vencatachellum Moodeliar 420 dd, Jail Hospital Nellore.

Entertained as 3d Class Native Medical Pupils from 27th April 1852 and directed to attend Medical College on the 1st Aug., next.

G. O. C. C. 14th June 1852.—Junior Medical Apprentice John Charles Watson to be Senior Medical Apprentice from 11th June 1852 vice Leonard promoted.

Paid Candidate Robert Joseph George Boyd, Junior Medical Apprentices David Augustus Philips, Thomas Doyle, from 31st May 1852 vice Owen, Hayes, and White discharged.

Unpaid Candidates James Albert Falloon, Paid Candidates John Green, James Joseph Flynn from 31st May 1852, in succession to Boyd, Phillips and Doyle promoted.

With reference to G. O. C. C. 27th May 1852 Passed Medical Apprentice Thomas Joseph Rielly is brought on the Establishment from the 31st May 1852, vice McQueen discharged.

G. O C.C. 18th June 1852.—2d Dressers E. Rungiah, No. 89 Saranjapaway No. 91 to be First Dressers from the 15th May 1852, vice Veerasawmy No. 49 and C. Yaterajooloo No. 54 Pensioned.

Junior Medical Apprentices Frederick Duckworth, John Wayne, William Baker, William Osman, James Fitzpatrick, Charles Pettegrew, to be Senior Medical Apprentices.

Paid Candidates John Hardaker, Daniel McDicken, John Constantine Seeyne, Frederick Fisher, Thomas William Higgins, Paul George Paul, to be Junior Medical Apprentices.

Unpaid Candidates Thomas Ward, James Walker, John Cornelius Fonsworth, George Wilkie, James Hennessy, Leonard Walter Lincoln, to be Paid Candidates. from the 5th June 1852, in succession to Flattery, Crawford, Daly, Wood, Georges and Wilkins promoted.

Paid Candidate John Edward Lillywhite, to be Junior Medical Apprentice, Unpaid Candidate John Sausman, to be Paid Candidate, from the 11th June 1852 in succession to Watson promoted.

G. O. G. 2d July 1852 No. 128.—Acting Assistant Apothecary Henry Hackett, to be Assistant Apothecary from the 29th June 1852 vice Wood resigned the Service.

Passed Medical Apprentice Jeremiah Gray to be Acting Assistant Apothecary from the 29th June 1852 vice Hackett.

G. O. G. 6th July 1852 No. 130.—Senior Assistant Surgeon Thomas Caverhill Jerdon to be Surgeon from the 29th February 1852 vice Harrison retired.

G. O. C. C. 7th July 1852.—Junior Medical Apprentices James Clement, Chris. Best Cassidy, to be Senior Medical Apprentice, Paid Candidate William Edward Stone, to be Junior Medical Apprentice, Unpaid Candidate William Gee, to be Paid Candidate, from 28th June 1852 vice Watson deceased.

G. O. C. C 10th July 1852.—Junior Medical Apprentice Frederick Alexander D'Sylva, to be Senior Medical Apprentice, Paid Candidate Anthony Lawrence Xavier, to be Junior Medical Apprentice, Unpaid Candidate William Karney, to be Paid Candidate, from 29th June 1852, in succession vice Hackett, promoted.

G. O. C. C. 20th July 1852.—2d Dresser V. Vencatakistnah No. 93 to be 1st Dresser from the 15th July 1852 vice Gopaul Kistnah No. 19 Pensioned.

REMOVALS AND POSTINGS.

MEDICAL OFFICERS.

G. O. C. C. 3rd July 1852.—Surgeon J. Darward, from doing duty 37th Grenadiers to 37th Grenadiers.

G. O. C. C. 12th July 1852.—Surgeon T. C. Jerdon, from late promotion to 4th Light Cavalry.

G. O. C. C. 17th July 1852.—Assistant-Surgeon J. T. Blenkin, to do duty 1st Regiment N. I.

MEDICAL SUBORDINATES.

G. O. C. C. 8th June 1852.—Assistant Apothecary B. Paul, from Superintending Surgeons Dept. Centre Division d. d. at Arcot, to do duty 2d Native Veteran Battalion, to join on its arrival at Arcot.

Do.	H. Flattery,	from late promotion	to 16th Regt. N. I.
Do.	H. Crawford,	do.	to do duty 5th Bat. Arty.
Do.	C. J. Daly,	do.	to 42nd Regt. N. I.
Do.	C. Wood,	do.	to 21st do.
Do.	R. Wilkins,	do.	to do duty 41st Regt. N. I.

2nd Dresser Iyasawmy No. 191 from Ootacamund to do duty Superintending Surgeon's Dept. Southern Division.

2nd Dresser Christian No. 314 from doing duty Superintending Surgeon's Dept. Southern Division to Ootacamund.

G. O. C. C. 14th June 1852.—Assistant Apothecary A. Lynn from H. M. 25th Foot to Superintending Surgeon's Dept. Mysore Division.

G. O. C. C. 14th June 1852.—C. Docy from Superintending Surgeon's Dept. Mysore Division to H. M.'s 25th Foot.

G. O. C. C. 17th June 1852.— Assistant Apothecary W. Lewis from d. d. 6th Regiment N. I. to 6th Regt. N. I.

G. O. C. C. 17th June 1852.—2nd Dresser T. Venkatasawmy No. 203 from Government Dispensary to Zillah of Honore.

G. O. C. C. 18th June 1852.—1st Dresser E. Rungiah No. 89 from late promotion to Civil Station at Cocanada.

G. O. C. C. 18th June 1852.—1st Dresser Sarangapawny No. 91 from late promotion to Dispensary at Kurnool.

G. O. C. C. 21st June 1852.—2nd Apothecary W. Dickins, from H. M.'s 84th Regiment to do duty Depot at Poonamallee to remain with H. M.'s 84th Regt. until relieved.

G. O. C. C. 21st June 1852.—Acting Apothecary J. Alcock, from late promotion to do duty H. M.'s 25th Regt.

G. O. C. C. 21st June 1852.—Assistant Apothecary B. H. Bond, from Sedasheghcer to A Troop Horse Artillery to remain at Sedasheghur until relieved.

G. O. C. C. 21*st June* 1852.—Assistant Apothecary J. Stimpson, from Government Dispensary at Sircy, until relieved, to Sedasheghur to join on being relieved at Sircy.

Assistant Apothecary A. Lynn, from Superintending Surgeon's Dept. Mysore Division to do duty H. M.'s 84th Regt.

Assistant Apothecary W. K. Kierulf from Leper Hospital Madras ordered on command towards Ongole to Superintending Surgeon's Dept. Mysore Division to proceed to join on his return to Madras from Command.

Assistant Apothecary J Shortt from 1st Light Cavalry to Leper Hospital Madras.

Assistant Apothecary A White, from doing duty 1st Madras Fusiliers to 1st Light Cavalry,

Acting Apothecary H. Hackett, from late promotion to do duty Government Dispensary.

Passed Medical Apprentice P. Anderson, from d. d, H. M.'s 15th Hussars to do duty 2d Light Cavalry until relieved.

G. O. C. C, 6*th July* 1852.—Assistant Apothecary W. P. Woodbridge, from 25th Regiment N. I. to Superintending Surgeon's Dept. Presidency Division.

Acting Assist. Apothecary J. Gray, from late promotion to 25th N. I.

G. O. C, C. 14*th July* 1852—2nd Apothecary G. Fonsworth, 4th Battalion Artillery. } From doing duty under Asst.-Surgeon Thompson appointed to the charge of the Field Hospital to be established at Amherst to do duty under the Senior Surgeon Tenasserim Provinces.

Assistant Apothecary S. B. Kemp, Superintending Surgeon's Dept. Presidency.

2nd Dresser Loganaudum, No. 123 Triplicane Dispensary,

G. O. C C. 20*th July* 1852—1st Dresser Chinnian, No. 85 from 3d District to Zillah of Nellore.

1st Dresser V Venkatakistnah, No. 93 from late promotion to 3rd District.

2nd Dresser A Veerasawmy, No. 121 from Zillah of Chingliput to Arnee Details,

2nd Dresser V. Barthasarathy, No. 197 from 52d N. I to Zillah of Chingleput.

G. O C C. 24*th July* 1852—Assistant Apothecary J Harris, from 46th Regiment N I to 47th Regiment N. I.

Assistant Apothecary J. W. McKenzie, from 47th Regiment N I. to 46th Regiment N I.

ORDERS OF IMPORT.

G. O. G. 1*st June* 1852.—No. 102 The Right Honorable the Governor in Council is pleased to notify that the Government of India have decided that Medical, being Military, are entitled, on passing the test of qualifications in two or more Native Languages established in G, O G. 16th April 1852, No. 68, to the reward of (1000) one thousand Rupees.

G. O G. 1*st June* 1852 No. 104—The following General Order by the Most Noble the Governor General of India in Council, is published for the information of the Army.

General Orders by the Most Noble the Governor General of India in Council,

Fort William, 14*th May,* 1852.

No. 313. The Most Noble the Governor General of India in Council, is pleased to direct the publication of the following Extract of a Military letter from the Honorable the Court of Directors to the Governor of the Presidency of Fort William in Bengal No. 32 of the 17th March 1852.

Para 16. "By the Government Order* of 19th July 1852, it is declared that the "attendance of Medical Officers in their professional capacity on the families of the "Officers of the Corps to which they are attached is an imperative part of the duty to "be performed by them," and that this Order "is applicable to Medical attendance "by Presidency Surgeons, Garrison Surgeons and Staff Surgeons of Stations on the "Officers of the Army and their families who may make application to them for pro-"fessional advice." Your decision that the principle of this Order is applicable to all cases in which a Military Officer requires aid for himself and family has our full approval.

G. O C C. 13*th July* 1852—No. 38 The Commander in Chief directs the following alteration to be made in the General Regulations,

* Published at Fort St, George, G O G 6th September 1822,

The following to be substituted for para 1. All Officers Medical as well as Military, *in whatever manner employed,* on arriving at the Presidency shall report themselves without delay to the Adjutant General of the Army and they shall also report their intended departure in like manner. These reports may be made either in person or writing—if by letter their place of residence must be distinctly specified, They are also to report immediately any change of residence during their stay,

Section XXXI, page 397, para 1.

LEAVE TO EUROPE ON MEDICAL CERTIFICATE.

G. O. G. 18*th June* 1852 *No.* 116.—Surgeon William Gilchrist M. D, Acting Surgeon of the General Hospital.

Assistant Surgeon F. George Williams, M. D. to embark from Cocanada or the nearest port in the Northern Division.

G. O. G, 27*th July* 1852, *No.* 147.—Assistant Surgeon P. G. Fitzgerald M. D. to embark from Bombay, his leave to have effect from the 12th June 1852, the date of his quitting Kamptee by permission of the Officer Commanding the Nagpore Subsidiary Force.

do H. I. Penny.

G. O. C. C. 14*th July* 1852.—Assistant Surgeon J. Thompson appointed to the charge of the Field Hospital of Amherst from date of quitting Amherst, Madras on Sick Certificate until further orders under the provisions of para 4 page 290 of the General Regulations.

G. O. *C. C,* 24*th July* 1852.—Assistant Surgeon G. E. Aldred M. D. Medical Department—In continuation to 31st Oct. 1852—Bangalore.

G. O. *C C.* 31*st July* 1852.—The G. O. C. C. dated Head Quarters, Ootacamund, 14th July 1852, granting Assistant Surgeon J. Thompson leave to Madras on s. c. from date of quitting Amherst is cancelled.

Assistant Surgeon J. Thompson, is to be considered on sick certificate from date of arrival at Madras to which he was permitted to return in consequence of his services not being required for the Field Hospital at Amherst.

G. O. C. C. 26*th June* 1852.—Apothecary G. Maidman Superintending Surgeon's Department—15th June 1852, to 31st Dec. 1852 Cuddalore s. c.

Assist. Apothecary H. Fuller 29th Regt. N. I. from 12th June 1852 to 15th Sept. 1852 Cuddalore s. c.

Assist. Apothecary P. Heron 12th Regt. N. I.—In continuation to 20th Aug. 1852 Madras.

G. O. C. C. 10*th July* 1852.—Assistant Apothecary C. Doig H. M. 25th Regiment from 12th July 1852 to 12th September 1852 Saint Thomas Mount.

G. O. C. C. 17*th July* 1852.—2nd Apothecary J Duckworth Pension Establishment from 15th July 1852 to 15th January 1852 Madras.

G. O C. C. 24*th July* 1852.—Apothecary G. Haldwell Civil Establishment Sircy in continuation to 4th Nov. 1852 Neilgherries s. c.

MISCELLANEOUS.

G. O, G. 4*th June* 1852 *No.* 105.—Assistant Surgeon James Edward Dickinson is permitted to enter on the general duties of the army.

W. James Charles Kelly Bond, who arrived at Madras on the 30th May 1852 is admitted upon the Establishment as an Assistant Surgeon in conformity with his appointment by the Honorable the Court of Directors, and is directed to do duty under the Surgeon of the 2d Battalion Artillery at Saint Thomas Mount.

G. O. *G.* 8*th June* 1852 *No.* 109.—With reference to G. O G. 18th May 1852, No. 89, Assistant Surgeon Edward D'Arcy Evezard, is appointed to do duty with the Left wing of H. M.'s 25th foot,

In the Judicial Department under date the 7th June 1852, Assistant Surgeon James Crawford, Civil Surgeon of Masulipatam, was granted leave of absence on private affairs for two months from the 1st May 1852, under the Resolution of the Government of India, dated 22nd November 1843.

G. O. *G.* 15*th June* 1852 *No.* 114.—W. Francis Day, who arrived at Madras on the 13th June 1852, is admitted upon the Establishment as an Assistant Surgeon in con-

formity with his appointment by the Honorable the Court of Directors, and is directed to do duty under the Surgeon of the 1st Madras Fusiliers at Bellary.

G. O. G. 18th June 1852 *No.* 116.—Assistant Surgeon C. King is permitted to enter on the general duties of the Army.

G. O. C. C. 4th June 1852.—With the sanction of the Right Honorable the Governor, Assistant Surgeon A. Hunter, M.D. Acting Medical Storekeeper Presidency, is appointed a Member of the Board of Medical Officers for the Examination of Sick Officers, vice Surgeon W. Gilchrist M.D. reported Sick.

G. O. C. C, 5th June 1852.—Assistant Apothecary P. Heron of the 12th Regt. N. I. on leave at the Presidency, is appointed as a temporary measure to (do duty with the 51st Regiment N. I. and will accompany) that Corps to Vellore whence he will return to Madras.

G. O. G. 22d June 1852 *No.* 121—Veterinary Surgeon Thomas Pritchard of the Bengal Army to be Veterinary Surgeon to the Right Honorable the Governors Body Guard as a temporary measure to take effect from the 11th June 1852.

The dates of rank of the undermentioned Officers are fixed as indicated against their names Assistant Surgeon Edward D'Arcy Evezard 27th January 1852, Assistant Surgeon James Charles Kelly Bond 1st February 1852 and Assistant Surgeon Francis Day 26th February 1852.

G. O. C. C. 7th June 1852.—The undermentioned Medical Officers and Subordinates are placed under the orders of the Officer Commanding the Madras Brigade of the Rangoon field force.

Assistant Surgeon J E. Dickinson.
do R. Barrow Dispensary 2nd District.
do C. Cole Chintadrapettah Dispensary.
do J. Wilson doing duty 1st Native Veteran Battalion.
do W. Powell 41st Regiment N I doing duty 5th Bt. Arty.
Passed Medical Apprentice C. Georges doing duty Chintadrapettah Dispy.
do J. Howard General Hospital.
2d Dresser M. Appavoo No, 362 doing duty Dispy at Kamptee.
do V. Yeatherajooloo No. 326 24th Regt. N. I.

The undermentioned Medical Subordinates are appointed to do duty as indicated against their names until relieved.

Apothecary A. Harris Supg. Surgeon's Dept. Presidency Division Dispensary 2d District.

Apothecary R. Harper Supg. Surgeon's Dept. Nagpore Subsidiary force on leave at the Presidency to Chintadrepettah Dispensary.

Assistant Apothecary E. Avery 2d Light Cavalry 1st Native Vet. Batn.

Passed Medical Apprentice W. Thomas 4th Batn. Artillery to 5th Batn. Artillery.

2nd Dresser C. Nieneappah No. 183 General Hospital to Chintadrapettah Dispy.

G. O. C. C. 17th June 1852.—The removal of 2nd Dresser A. Hyasawmy No. 128, in G. O. C, C. of the 19th ultimo, is cancelled.

G. O. C. C, 18th June 1852.—Assistant Apothecary W. K Keirulf attached to the General Hospital, is directed to proceed towards Ongole for the purpose of relieving Apothecary T King of the Superintending Surgeons Department Hyderabad Subsidiary force in Medical Charge of Details of Artillery and 2nd European Light Infantry enroute from Secunderabad to St. Thomas Mount.

G. O C C. 21st June 1852 —Acting Apothecary J Munro, late promotion, is directed to proceed to Bezwarah and afford Medical aid to the Officers and people employed in the construction of the Kistnah Annicut and its Subsidiary work.

G. O G. June 25th 1852 *No.* 122.—In the Revenue Department under this date Assistant Surgeon Henry James Penny, in Medical charge of the Civil Establishment and Irregular Horse at Kurnool, has been granted leave of absence for three months to visit the Presidency on Medical certificate, under the provisions contained in the Resolution of the Government of India of the 23rd March 1843, preparatory to applying for leave to proceed to Europe.

G O G 29th June 1852 *No.* 124.—The following Extracts from Despatches from the Hon'ble the Court of Directors dated 19th and 24th May 1852, Nos. 39 and 41 are published for the information of the Army,

Letter dated 19th May 1852, No 39.

We have permitted the undermentioned Officers to return to their duty.

Surgeon H. G. Graham.
Assistant Surgeon John Matheson, M. D.
do. John Arthur, M. D.

Letter dated 24th May 1852, No. 4.

We have appointed Dr. Marcus Dill Campbell, now abroad, an Assistant Surgeon upon your establishment, Dr. Campbell's Order of rank will be transmitted in due course.

G. O. G. 29th June 1852, *No.* 126.—In the Judicial Department under this date Assistant Surgeon James Crawford, Civil Surgeon of Masulipatam, has been granted leave of absence in extension for three months to visit Madras and the Eastern Coast on Medical Certificate, under the resolution of the Government of India dated 22d November 1843.

Assistant Apothecary William Wood is permitted to resign the service of the Hon'ble the East India Company.

G. O. G. 2d July 1852, *No.* 128.—Surgeon Thomas Dalzall Harrison is permitted to retire from the service of the East India Company from the 29th February 1852, on the Pension of £191 per annum.

G. O. G. 6th July 1852, *No.* 130.—Senior Assistant Surgeon Thomas Caverhill Jerdon to be Surgeon from the 29th February 1852, vice Harrison retired.

G. O. C. C. 28th June 1852.—The undermentioned Medical Subordinates have been passed by the Board of Examiners.

Second Apothecary	J. Murray	As Apothecaries.
do.	D. Conwell	
Asst. Apothecary	G. Secluna	As 2d Apothecaries.
do.	E. C. Houghton	
do.	G. Sampson	

G. O. G. 9th July 1852. No. 133.—Assistant Surgson H. F. C. Cleghorn M. D. to act as Professor of Botany, Materia Medica and Therapeutics during the employment of Surgeon J. E. Mayer on other duty.

G. O. G. 13th July 1852, *No.* 134.—Assistant Surgeon J. T. Blenkin who arrived at Madras on the 8th July 1852 has returned to his duty by permission of the Honorable the Court of Directors without prejudice to his rank.

G. O. G. *13th July* 1852.—Assistant Surgeon F. J. Windus is permitted to enter on the general duties of the Army.

G. O. G. *13th July* 1852.—In the Revenue Department under this date Assistant Surgeon Charles James Rogers has been appointed to act as Medical Officer in charge of the Civil Establishment and Irregular Horse at Kurnool during the absence of Assistant Surgeon H. J. Penny or until further orders.

G. O. *C. C. 5th July* 1852.—Assistant Surgeon J. FitzPatrick of the 1st L. C, doing duty 4th Battalion Artillery is appointed to afford Medical Aid to the District of the 51st N. I under orders to proceed from Madras on the 10th Instant to Vellore, until relieved by a Medical Officer from the latter Station.

G. O. *C. C. 8th July* 1852.—Assistant Apothecary W. K. Kierulf of the Superintending Surgeon's Department Mysore Division now at the Presidency, is appointed to do duty at the General Hospital until further orders.

With reference to G. O. C. C. of the 20th Instant, 1st Dresser Chinnean No. 85, attached to the Zillah of Nellore, will continue to do duty under the Surgeon of the 3d District until relieved.

G. O. G. *27th July* 1852, *No.* 147.—Assistant Surgeon J. Arthur M. D. who arrived at Madras on the 25th July 1852, has returned to his duty by permission of the Honorable the Court of Directors, without prejudice to his rank.

G. O. *C. C. 29th July* 1852.—2d Dresser Appavoo No. 217, doing duty with the 2d Battalion Artillery is appointed to afford Medical Aid to the Details (with families) of the 1st Regiment N. I. under orders to proceed from Madras on the 31st Instant to Arnee, whence he will rejoin his Battalion at the Mount.